

III-5528V

VASILE CHIRICA

THE GRAVETTIAN
IN THE EAST
OF
THE ROMANIAN
CARPATHIANS



JASSY • 1989

Academia Română - Filiala Iași
INSTITUTUL DE ARHEOLOGIE
Bd. Ștefan

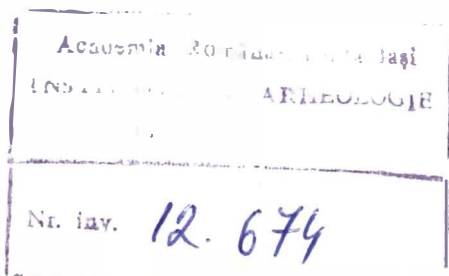
Cota: III - 5528 U

**THE GRAVETTIAN IN THE EAST
OF THE ROMANIAN
CARPATHIANS**

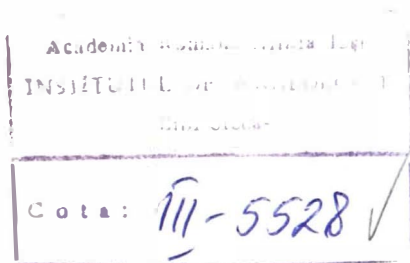
BIBLIOTHECA ARCHAEOLOGICA IASSIENSIS

III

Editors : VASILE CHIRICA and DAN MONAH



VASILE CHIRICA



**THE GRAVETTIAN IN THE EAST
OF
THE ROMANIAN CARPATHIANS**

**"AL. I. CUZA" UNIVERSITY OF JASSY
JASSY — 1989**

VASILE CHIRICA, DAN MONAH (Eds.)
BIBLIOTHECA ARCHAEOLOGICA IASSIENSIS

III

**THE GRAVETTIAN IN THE EAST
OF THE ROMANIAN
CARPATHIANS**

BY
VASILE CHIRICA

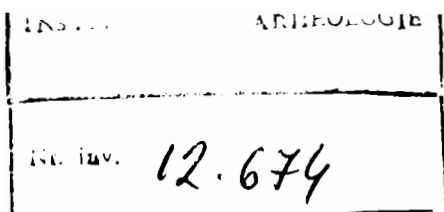
**Translated into English by : MIHAI-EUGEN AVĂDANEI, ANCA CEHAN,
VALERIA DINESCU, MANUELA MACARIE,
OCTAVIA OCU, FLORIN TECUCEANU,
GABRIELA FROICU**

Scientific reviewer : MARIN CÂRCIUMARU

Cover and illustrations by : WALTRAUD DELIBAŞ

**This study has been assembled by the Prehistory Collective of THE
INSTITUTE OF HISTORY AND ARCHAEOLOGY
„A. D. XENOPOL“ of the „AL. I. CUZA“ UNIVERSITY
OF JASSY**

**THE ACADEMY FOR SOCIAL AND POLITICAL SCIENCES OF THE
SOCIALIST REPUBLIC OF ROMANIA**



CONTENTS

FOREWORD	7
I HISTORY OF GRAVETTIAN TECHNOCOMPLEX	10
II. GEOGRAPHIC PARAMETERS	15
III. GRAVETTIAN SITES IN THE EAST OF THE CARPA- THIANS	36
1. Cotu Miculinți	36
2. Crasnaleuca	41
3. Ghireni	45
4. Mitoc — Valea lui Stan	46
5. Mitoc — Malul Galben	48
6. Mitoc — Piriul lui Istrati	56
7. Ripiceni — Stinca	62
8. Ripiceni — Izvor	66
9. Ripiceni — Valea Badelui	72
10. Dorohoi — Strachina	73
11. Udești — Poiana	76
12. Dolhasca — Dealul Viei	78
13. Topile — Dealul Stoicii, Dealul Catargii	80
14. Movileni — În Răzășie	83
15. Bistricioara — Lutărie	84
16. Ceahlău — Bofu Mic, Bofu Mare	89
17. Ceahlău — Dîrțu	91
18. Ceahlău — Cetățica I	94
19. Ceahlău — Cremenîș I and II	97
20. Ceahlău — Podiș	98
21. Piatra Neamț — Poiana Cireșului	101
22. Bicăz — Izvorul Alb	103
23. Bicăz — Ciungi	105
24. Valea Ursului	106
25. Buda — Dealul Viei	108
26. Lespezi — Lutărie	110
27. Curteni	116

28. Mălușteni II—V	116
29. Berești — Dealul Taberei	120
30. Pleșa	121
31. Puricani	122
32. Țepu	124
33. Cavadinești	125
34. Suceveni	126
35. Moscu	128
IV. THE CHARACTERISTICS OF GRAVETTIAN HABITATIONS	129
V. GEOCHRONOLOGY OF THE GRAVETTIAN HABITATIONS	140
VI. ILLUSTRATIONS	152

FOREWORD

A century has passed since the geologist Gregoriu Ștefănescu published in „The Annual of Romania's Institute of Geology” his first Paleolithic discoveries at Miloc, on the Middle Prut River. Fifty years have also passed since the geologist and archaeologist N.N. Moroșan presented his doctor's thesis, „Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est”. It still is a treasure work valued for his studies and for the importance of his more than 35 Paleolithic sites discovered on the Prut and Dniester terraces.

Similar to the first Paleolithic discoveries in Romania, the earliest studies on the Paleolithic Gravettian Technocomplex were also made in the region at the east of the Carpathians. We have in view the excavations made on the Bistrita terraces in the Ceahlău zone, in 1956—1958. They were resumed in the 1970's by Al. Păunescu, as soundings for soil samples for pollen determinations. The latter also brought about new proposals for the stratigraphic schemes there.

The earlier research had led to proposals for geochronological structuring and were published in 1965. They have been the traditional model for the Gravettian in Romania, to which all the discoveries have subsequently referred.

The later pollen determinations made by M. Cărciumaru led to the devising of a new relative geochronological scheme of the Paleolithic in Romania. The new suggestions for orderings were based on Al. Păunescu's archaeological data. These were generally confirmed by the still later C-14 dating analyses published by Păunescu.

This new geochronology scheme suggested by M. Cărciumaru has offered a more adequate frame for the ordering of Gravettian settlements and habitation levels in Romania. They are in agreement with most European datings. Most of Cărciumaru's proposals were confirmed by C-14 readings. Others will have to be further dealt with due to the increasing number of local C-14 age determinations.

According to personal information received from K. Honea, the consultant in radiocarbon dating on our projects, results are to be read as follows: normally age determinations are usually released by all laboratories at one standard deviation (1 SD) at 68% certainty. In exceptional cases, as in the cases of small quantities of carbon, they are given at two standard deviations (2 SD) at 95% certainty. Special arrangements were made by Honea with both the Groningen

(C-14) and Oxford (AMS technique) laboratories in processing samples from Mitoc. Their technical assistance is herewith gratefully acknowledged.

An important part in establishing the Gravettian origins and chronology in Romania has been played by our own studies at Mitoc on the Middle Prut River beginning with 1972. The excavations in the large site of Mitoc-Malul Galben are still going on but no sooner than 1991 when we are to publish "The Gravettian at Mitoc" (the first volume of the "Mitoc-Malul Galben Monograph"), shall we be able to establish a definite geochronological frame of the Gravettian in Romania. We hope that by then the new typological lists of the whole lithic industries found in the Paleolithic sites of our country will also have been published. Agreement on typology, statistics, and archaeological and geological stratigraphy will be reconsidered for several sites with Gravettian habitation levels. Their corroboration with the latest results of Romanian archaeological research should create a most adequate framework for the objective ordering of the local Gravettian in Romania.

The present study tries to systematize the Gravettian discoveries east of the Romanian Carpathians and contains new proposals of geochronological and cultural re-evaluations. Our access of collections of paleolithic material from other zones of the Continent is still limited. We couldn't propose any relations, facies or cultural groupings, as J. K. Kozłowski and M. Otte so pertinently did, after their quasi-complete studying of lithic industries in large central and east European geographic areas. We hope to be able to reach this knowledge, understanding and interpretation in the first volume of the Mitoc monograph. Therefore, our colleagues' suggestions will be really useful.

The volume is made up of four chapters. In Chapter III are described the 35 Gravettian sites in Romania's east Carpathian space investigated through systematic excavations. We have given for each site, according to the opinion of the authors of investigations, the archaeological and geological stratigraphy, the lithic tools, the palaeofauna, the geochronological dating. The subchapter of "conclusions" belongs to the author (Vasile Chirica). The bibliography includes the reference studies of the author of investigations and of other specialists who dealt with various aspects of the respective site.

The study "The Gravettian in the East of the Romanian Carpathians" has been part of the scientific research project of the Academy for Social and Political Sciences, which has also sponsored the whole research work, as well as the excavations at Mitoc. The "Al. I. Cuza" University of Jassy and the Jassy Branch of the Research and Planning for Water Administration Institute have ensured the printing facilities. The C-14 datings were done through Professor K. Honea, in the laboratories Geochron, U.S.A., Groningen in Holland and Oxford, Great Britain. Professor M. Petrescu-Dimbovița, the head of the "A. D. Xenopol" History and Archaeological Institute, has constantly provided encouraging advice. The translation of the whole text into English is due to Mihai-Eugen Avădanei (from "Costache Negruzzi" High School), who also corroborated all the translations, made them homogeneous from a lexical point of view and typed the English version of the study, Anca Cehan (from "Emil Racoviță" High School), Valeria Dinescu, Manuela Macarie, Octavia Ocu, Florin Tecuceanu (all the four from "Al. I. Cuza" University), and Gabriela Froicu (from Mitoc School).

and to the generous assistance of Sorin Pârvu (from "Al. I. Cuza" University). We have also benefited from the competent advice given by our colleagues of the "A. D. Xenopol" History and Archaeology Institute: Gheorghe Buzadu, Stela Cheptea, Ion Ioniță, Dan Monah, Rodica Popovici and Victor Spinei. Many corrections in English stylistic expressions were made by K. Honea at Mitoc. To all of them, our most sincere gratitude.

* * *

Bibliotheca Archaeologica Iassiensis reaches with this monographic study its third issue. It shall continue publishing archaeological studies and monographic works in two series: a Romanian series, edited by Vasile Chirica, and an international one, edited by Vasile Chirica and Dan Monah.

In the period 1989–1991, we intend to print the following volumes: "The Stone Age in Romania in Its European Context", edited by Vasile Chirica and Dan Monah; "The 4-th c. A. D. Necropolis of Miorcani-Botosani" by Ion Ioniță; "The Cucuteni Culture" by Anton Nițu; "Annotated Bibliography of the Paleolithic in Romania" by Vasile Chirica, Roxana Dobrescu and Marin Cărciumaru; "The Mitoc-Malul Galben Site: 1. Gravettian Habitations" by Vasile Chirica and K. Honea; "9-th and 10-th c. Migrations and Migrators on the Romanian Area" by Victor Spinei; "The Neolithic Site of Mărgineni-Bacău" by Dan Monah. Most of these volumes will be published in French or English in order to make them easy of access for all the specialists the historic realities of the Romanian territory, in the broader context of the succession of civilizations on the whole Europe.

Jassy, April 1989

Vasile Chirica

CHAPTER I

HISTORY OF THE GRAVETTIAN TECHNOCOMPLEX

The discovery of La Gravette paleolithic station was made in 1880 at Bayac, a village in Dordogne, France. The search that followed allowed archaeologists to recognize and define a cultural stage of the Upper Paleolithic, later identified throughout the Continent. The stratigraphy of the station, as well as the morphological nature of the lithic tools also led to the eventual discovery of several cultural facies characteristic of the most recent paleolithic period. Thus, the first level (the earliest) was attributed to a developed stage of the Aurignacian. The layer was characterized by an abundance of small leaf-shaped points having direct or reverse marginal retouch. They seemed to correspond to an archaic form of the Gravettian industry, called Bayacian by F. Lacorre. It was similar to the Périgordian IV stage in D. Peyrony's classification¹.

The following three stratigraphic levels were considered as representing the specific character of the Gravettian, defined as such by D.A.E. Garrod². He also introduced the term of "Oriental Gravettian" in order to denote various ensembles of the European Upper Paleolithic³. Earlier, other archaeologists had tried to differentiate between certain technocomplexes, on the basis of particular tool characteristics. Thus, after a trip she made to Central Europe, in order to know the archaeological realities, she attributed the discoveries at Dolni Věstonice to a recent stage of the "Upper Aurignacian" of the French cycle. Her observations were based on the abundance of backed ("à dos")

¹ M.-N. Brézillon, *Dictionnaire de la Préhistoire*, Larousse, Paris, 1969, pp. 45, 114 ; D. Peyrony, *Les industries „aurignaciennes“ dans le bassin de la Vézère*, in *B.S.P.F.*, 30, 1933, pp. 543—559.

² D. A. E. Garrod, *The Near East as Gateway of Prehistoric Migration*, in *BASPR*, 1937, pp. 17—21 ; idem, *The Upper Paleolithic in the Light of Recent Discovery*, in *P.P.S.*, 4, 1938, pp. 1—26.

³ *Ibidem*.

pieces⁴. During the same decade, the term "Předmostian" was proposed to define the specific character of the findings at that station in Moravia⁵.

In 1933, Peyrony brought in the most important specifications of that time in the "Aurignacian — Perigordian" relationship⁶. The latter term takes precedence over "Gravettian" in certain European areas.

The second half-century began with identification of new facies and denominations in order to define more or less regional and local aspects of the Gravettian (Perigordian) culture. Thus, the term "Pavlovian", an equivalent of the older "Předmostian", was used to describe either lithic assemblages in Central Europe, or only those in Moravia⁷.

During the same period there were other proposals for names of facies or lithic assemblages specific to certain geographic areas or eponymous stations. Thus, scientists tried to introduce new names in literature: "Aggsbachian" (Lower Austria, proposed by J. Bayer), "Pavlovian" (Moravia, by D. Klima), "Kostenkian" (the Don area, by C.S. Nicolăescu-Plopșor)⁸. We should add the attempts at a most exact possible definition of technocomplexes in various regions of the continent⁹.

A renewed attempt at defining the specific features of the Gravettian was made by F. Lacorre¹⁰. He specified that there were certain distinctions among the lithic tools of Central, West, and East Europe. V. Gordon Childe tried to give a full solution to the relationships between "Kostenkian" and „Eastern Gravettian“¹¹. After him, the classic West European scheme of the development of the Upper Paleolithic should be given up: Aurignacian, Gravettian, Solutrean, Magdalenian.

The later archeological research has led to new discoveries, as well as to the reconsideration of the earlier ones. New Gravettian facies which developed almost simultaneously in time, their technical and typological dis-

⁴ J. Bayer, *Eine Mamutjägerstation im lös bei Pollan, in Südmähren. Die Eiszeit*, I, 1924, pp. 81—88; idem, *Die ältere Steinzeit in den Sudetenländern*, Reichenberg, 1925; N. Breuil, *Notes de voyage paléolithique en Europe Centrale. II. Les industries paléolithiques du loess de Moravie et de Bohême*, in *L'Anthropologie*, 34 1924, pp. 515—552.

⁵ J. Bayer, *Das Zeitliche und Kulturelle Verhältnis zwischen den Kulturen des Schmalklinkenkulturreis während des Diluviums in Europa*, in *Eiszeitalter und Gegenwart*, Öhringen, Württemberg, V, 1928, pp. 9—23.

⁶ D. Peyrony, *op. cit.*, pp. 545 sq.

⁷ H. Delporte, *Notes de voyage leptolithique en Europe Centrale: I. La Tchécoslovaquie*, in *Rivista di Scienze Preistoriche*, 14, 1959, pp. 19—57; B. Klima, *Zur Problematik des Aurignacien und Gravetien in Mittel-Europa*, in *Archaeologia Austriaca*, Vienne, 26, 1959, pp. 35—51.

⁸ C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău, in Dacia*, N. S., X, 1966, p. 21.

⁹ B. Klima, *op. cit.*, pp. 35—51; idem, *Pavlov, nouvelle station paléolithique de la Moravie méridionale*, in *Archeologické Rozhledy*, Prague, VI, 1954, 6, pp. 721—728; P. I. Boriskovski, N. D. Praslov, *Paleolit basseina Dnepra i Priazoviia*, in *Arheologija SSSR*, svod A₁₋₃, Moscou 1964, pp. 7—49; P. P. Efimenko, *Kostenki I*, Moscou, 1958, pp. 209—289; P. I. Boriskovski, *Paleolit Ukraini*, in *MIA*, 40, Moscou, 1953, pp. 176 sq.; A. N. Rogatcev, *Kostenki IV-paselenie drevne-kamennogo veka na Donu*, in *MIA*, Moscou, 1955, pp. 9—163; J. K. Kozlowski, *Bemerkungen über den Stand der Paläolithforschung in Polen*, in *Archaeologia Austriaca*, 30, Vienne, 1961, pp. 118—130; M. Gábori, *Etudes archéologiques et stratigraphiques dans les stations du loess paléolithiques de Hongrie*, in *Acta Archaeologica*, Budapest, VIII, 1957, pp. 1—117, etc.

¹⁰ F. Lacorre, *La Gravelle (le Gravettien et le Bayacien)*, Laval-Barneond, Paris, 1960.

¹¹ V. Gordon Childe, *Kostenki: „East Gravettian“ or „Solutrean“?*, in *Annual Report of the University of London, Institute of Archaeology*, XII, 1956, pp. 8—19.

inctions were identified: the "Willendorbian" in Lower Austria (the old Aggsbachian), the "Pavlovian" in Moravia, the "Molodovian" on the Dniester, the "Kostenkian" on the Don, the "Sagvarian" in Hungary¹². Other specialists used the generic term of „Gravettian“ in order to define the second stage of the European Upper Paleolithic, including France where traditionally the term "Perigordian" was used¹³.

In Romania, the research of this technocomplex generally followed the same development as in the rest of Europe, especially that in France. Thus, in his work on the Upper Paleolithic in the north-east of Romania, N. N. Moroşan ascertained that the discoveries at the Stinca—Ripiceni grotto according to the knowledge of that time, were affiliated with the Aurignacian, Solutrean, and Magdalenian¹⁴. Later they were found to belong to Aurignacian and Gravettian levels¹⁵.

Based upon careful analysis of the residential complexes made by J. K. Kozłowski, the existence of several distinctive Gravettian facies could be established in time and space in East Europe. He took into consideration several elements: a) establishing of the geochronological dates of all the habitation complexes of as many as possible archeologic stations with Aurignacian and Gravettian levels in order to follow their succession on the basis of relative and absolute chronology; b) comparative analysis of the lithic assemblages of the stations of the Kostienki-Andievo group, both among themselves and with those belonging to other stations in various geographic areas, in order to determine similitudes and differences; c) comparative analysis of the lithic tools and the osseous stock in the stations of the Kostienki group; d) establishing of the typology of those items considered as "directing fossils" of the Kostienki group, in order to positively determine the appearance of types of tools (shouldered points or the Kostienki type knives) in other settlements or levels of Gravettian habitation¹⁶.

¹² J. K. Kozłowski, *Etude sur la différenciation de la culture dans le Paléolithique de l'Europe Centrale*, in *Prace Archeologiczne*, 7, Cracovia, 1965; idem, *L'âge de la pierre sur le territoire polonais*, Varsovie, 1977; idem, *Upper Paleolithic and Mesolithic in Europe. Taxonomy and Palaeohistory*, in *Prace Komisji Archeologicznej*, 18, 1979, 179 p.; idem, *La signification paléo-ethnographique des unités taxonomiques du Paléolithique supérieur: l'exemple du Gravettien oriental*, in *La signification culturelle des industries lithiques*, Actes du Colloque de Liège, B.A.R., Int. Series 239, Oxford, 1985, pp. 115—138.

¹³ Cf. *Actes du Colloque International du Centre National de la Recherche Scientifique*, Nr. 271; *La fin des temps glaciaires en Europe. Chronostratigraphie et écologie des cultures du Paléolithique final*, vol. I—II, Bordeaux, 1979; M. Otte, *Le Gravettien en Europe Centrale*, vol. I—II, Brugge, 1981; H. de Lumley, *Cadre chronologique absolu, paléomagnétisme, chronologie paléontologique et botanique, esquisse paléoclimatologique, séquences culturelles*, in idem (sous la direction), *La Préhistoire française*, tome I, I, pp. 5—25.

¹⁴ N. N. Moroşan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est. (Les dépôts géologiques, leur faune, flore et produits d'industrie)*, in *Anuarul Institutului Geologic al României*, vol. XIX, Bucureşti, 1938; idem, *La station paléolithique de Stinca—Ripiceni*, in *Dacia*, V—VI, 1935—1936.

¹⁵ M. Brudiu, *Paleoliticul Superior şi Epipaleoliticul din Moldova*, Bucureşti, 1974.

¹⁶ Janus K. Kozłowski, *Problem tzw. Kultury Kostienkovsko Willendorfskiej*, cz. I, in *Archeologia Polski*, XIV, 1969, 1; idem, *Les industries à pointes à cran en Europe Centre—Est*, in *IX-e Congrès U.I.S.P.P.*, Nice, 1976, Colloque XV, *Périgordien et Gravettien en Europe*, pp. 121—127.

Another detailed analysis of almost the whole of the Gravettian technocomplex in Central Europe, in which he also included the Ukraine with its technico-typological groups, has been made by M. Otte. It enabled him to establish as many as eight cultural-chronological facies¹⁷, to which certain Gravettian levels in Romania may also be connected¹⁸.

It is not our intention to write a history of the Gravettian research in Romania, but we must mention that the most important advances in this field have been achieved since 1970. The investigations made by a number of specialists formed the basis of the most important syntheses published here¹⁹. An important contribution has also been made by the pollen analyses carried out in most of the Paleolithic stations investigated through systematic excavations. A geochronologic diagram specific to the Paleolithic in Romania was established. These findings have found corroboration with those generally accepted in Europe²⁰.

The specialized studies done by the Romanian paleolithicians have brought in extremely important and useful contributions to the knowledge of this last culture of the Upper Paleolithic on our country's territory. Thus, besides establishing the most detailed typology of lithic tools, the relationships among human groups belonging to various geographic areas could be rendered evident based on the identity of the types of tools and the presence of the raw material, as well as the analogies to large cultural groups in Europe.

The main questions of the study of the East Gravettian Technocomplex in Romania are the origins of this culture and its internal developments. In this respect, we must mention that the Gravettian on the Prut and the Bistrița terraces is now almost unanimously accepted. It can be argued that a series of back and forth movements of populations took place in the Dniester, Prut and Bistrița river basins²¹, although the data offered by absolute chronology seem not to support that polyphyletic origin.

Recent archeological studies carried out at Mitoc-Malul Galben, an important Paleolithic station, have brought in extremely significant data concerning the origins of the East Gravettian, as well as its lower absolute chronological limits. They have led us to the conclusion that certain stages of the Aurignacian settlements were contemporary to those at Mitoc-Malul Galben. Thus, taking into account that the oldest Gravettian level at Malul Galben has been dated to $27,150 \pm 750$ B.P., an age close enough to Willendorf II, Austria we may very easily infer that the Gravettian on the Prut is older than that on

¹⁷ M. Otte, *Le Gravettien en Europe Centrale*, vol. I—II, Brugge, 1981.

¹⁸ V. Chirica, *La genèse et l'évolution des cultures du Paléolithique Supérieur dans la zone du Prut Moyen d'après les recherches récentes*, in *La Genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, 1987, pp. 25—40.

¹⁹ Al. Păunescu, *Evoluția uneltelor și armelor de piatră cioplită descoperite pe teritoriul României*, 1970; M. Bitiri, *Paleoliticul în Țara Oasului*, București, 1972; Florea Mogoșanu, *Paleoliticul din Banat*, București, 1978; M. Brudiu, *Paleoliticul Superior și Epipaleoliticul din Moldova*, București, 1974.

²⁰ M. Cărciumaru, *Mediul geografic în Pleistocenul superior și culturile paleolitice din România*, București, 1980.

²¹ M. Brudiu, *Paleoliticul Superior și Epipaleoliticul din Moldova, studiu arheologic*, București, 1974, p. 45.

the Dniester. We can no longer agree with the theory according to which the development of this culture originates in the Kostienki-type Gravettian Technocomplex. Radiocarbon age determinations have also altered the traditional limits of the beginnings of the Gravettian, with over seven thousand years compared to what had been known and estimated before the Paleolithic research at Mitoc-Malul Galben. We must still specify that these considerations were to be fully proved by subsequent radioactive carbon measurements that we have received from the USA, the Netherlands and England. A number of samples of charcoal and unburnt bone have been sent there for laboratory analyses in collaboration with Prof. K. Honea, Northern Illinois University, Dekalb, Illinois, USA.

Extremely important results have now been reached by internal research here. Based on C-14 datings, they have been obtained from laboratories in the above-mentioned countries. Most of them stem from archeological sites in north-east Moldavia. The Romanian archeologists have now the possibility of working out the necessary correlations among the geologic and archeologic stratigraphy, the technico-typologic characteristics of the lithic assemblages and the relative and absolute chronology. Also, characteristics of the Gravettian settlements in Romania are to be corroborated with those of other geographic areas of Europe with a view to integrating the Romanian Upper Paleolithic within the European one and defining the characteristic features here²². Thus, Romanian specialists have obtained extremely significant results (although K. Honea holds contrary opinions²³). They are comparable to those achieved in the rest of Europe concerning cultural-chronologic and technico-typologic position of the lithic assemblages and determination of relationships and of possible connections with contemporary populations in geographic periglacial areas of the Carpathian-Danubian region.

The use of the term „technocomplex“ in this report conforms to that originally proposed: „.... a group of cultures characterized by assemblages sharing a polythetic range but differing specific types of the same general families of artifact types, shared as a widely diffused and interlinked response to common factors in environment, economy and technology“²⁴.

²² Al. Păunescu, *Evoluția istorică pe teritoriul României din paleolitic până la începuturile neoliticului*, in *SCI VA*, 31, 1980, 4, pp. 519–545; idem, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud-european*, in *SCI VA*, 35, 1984, pp. 235–265; V. Chiriac, *Datarea prin C-14 a unor locuiri gravetiene de la Mitoc—Malul Galben, com. Mitoc, jud. Botoșani*, in *SCI VA*, 35, 1984, 1, pp. 74–79; idem, *La chronologie relative et absolue des habitats aurignaciens et gravelliens de la Roumanie*, in *The World Archaeological Congress. The Pleistocene Perspective*, vol. I, Southampton and London, 1986, 32 p.; idem, *op. cit.* in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, 1987 pp. 25–40.

²³ Cf. paper „Dating and Periodisation Strategies of the Romanian Middle and Upper Paleolithic: A Retrospective Overview and Assessment“, in *The World Archaeological Congress. The Pleistocene Perspective*, vol. I, Southampton and London, 1986.

²⁴ D. L. Clarke, *Analytical Archaeology*, 2-nd edition, London, 1978, p. 495; C. Gamble, *The Palaeolithic Settlement of Europe*, Cambridge, 1986, p. 9; J. K. Kozłowski, *The Gravettian in Central and Eastern Europe*, in *Advances in World Archaeology*, 1986, 5, p. 131.

CHAPTER II

GEOGRAPHIC PARAMETERS

A full understanding and thorough study of the Paleolithic period as a whole, of each of its cultural stages, cannot be reached without detailed knowledge of the characteristics of the natural environment of the geographic area under investigation: geology and geomorphology, climatic conditions, which sometimes caused substantial alterations to flora and fauna. Also, a close correlation of the specific features of forms of relief utilized by prehistoric populations in locating their settlements is necessary for the knowledge and interpretation local or regional cultural aspects, thus creating the possibilities of enlarging the area of investigation in both time and space. This is why we first intend to define the geographic area to be taken into account. We shall focus on those forms of relief that were predominantly used by the Gravettian groups in Moldavia: river terraces, plateaux, cuestas and even colluvia¹.

Gravettian settlements are physically located in the Romanian East Carpathian area which consists of the whole Moldavian Plateau and the Bistrița valley beginning with the flysch zone. Geologic, geomorphologic characteristics, climate and all its components, flora and fauna associations will be dealt with taking into account the geographic units: the Moldavian Plain, the Suceava Plateau, the Birlad Plateau and the flysch zone in the East Carpathians. In these ecologic environments, the richest and most intensely inhabited Gravettian settlements were identified. Based on the data we have so far gathered, the oldest deposits in the Middle Prut zone seem not to belong to the Neozoic age (70 million years), more precisely to the Tortonian, a subdivision of the Neogene. This series can be seen in the open on the right bank of the Prut River, between Ivăncăuți, Cuzlău and Liveni². The presence of Bryozoa, developed on the limestone with *Lithothamnium* indicates a sea depth of up to 200 m, normal salinity, warm weather and a good oxygenation

¹ For a better knowledge of these terms, including parallels with the European specialized literature, cf. V. Băcăoanu, I. Donisă, I. Hârjoabă, *Dicționar geomorfologic*, București, 1971, *passim*.

² Natalia Paghida, *Briozoarele din tortonianul din Nord—Estul Moldovei*, in *AȘU — Iași, Serie nouă, Științele naturii*, secț. II-a, 1961, 2, pp. 382 sq.; Emilia Saulea, *Geologie istorică*, București, 1967, pp. 717 sq.

by currents³. In the deposits were found Branchiopoda (*Argiope squamata* Eichwald., *Megerlea truncata* Gmel.) and Lamellibranchiatae (*Pecten elegans* Andrz., *Pecten Neumayri* Hilbert, *Pecten Lilli* Pusch), all the fossils found in friable marls ending the Tortonian neogenous series on the right bank of the Prut river⁴.

The oldest deposits in the area under investigation belong to the Cretaceous system of the Mesozoic Era (150 million years), which is a continuation of that on the Russian Platform. On the Middle Prut River between Rădăuți and Liveni, at water level, there are a few metres of chalky, white-grey marls, with dark silices, with few *Exagyna Columba* of the Cenomanian age⁵.

In cross-section, the Cretaceous system, made up of chalk with silices and ammonite fauna unconformably supports the argillaceous sandy Neogene with *Lithothamnium*, Lamellibranchiatae and gasteropoda. The two zones contact through an erosion surface, which is distinguished by its irregular plane, often with perforations by lithophagous mollusca⁶. We shall mention here that the limestones near Mitoc as well as those in the vicinity of Stînca Ștefănești and Manoleasa-Prut villages⁷, also belong to the Upper Cretaceous system.

After the Tortonian, there follows the Sarmatian, present in the Middle Prut area by fossils of gasteropoda (*Rissoa Mohrensternia inflata* Andrz., *Modiola Navicula* Dub., *Cardium irregulare* Eichwald, *Cardium proctratum* var., *Ruthenica* Hilbert)⁸.

The Sarmatian limestone appears south of Liveni, between Manoleasa and Bold villages, on the lower course of the Volovăț stream, at Ripiceni, north of Movila Ruptă, and between Lehnești and Stînca villages where it is the highest⁹. Northwards, it continues beyond Manoleasa, and at Mitoc it is present under the form of boulders contained in a loess layer¹⁰.

Malacologic fauna of this limestone is composed of: *Modiola navicula* Dub.; *Cardium proctratum* Eichw.; *Cardium proctratum* Var.; *Ruthenicum* Hilb.; *Cardium* cfr. *irregulare* Eichw.; *Ostrea* sp.; *Rissoa inflata* Andrz.; *Hydrobia ventrosa* Montf.; *Bula* sp.; *Cerithium pictum* Bart.; *Cerithium pictum* Var. *Ștefănescui* Font.; *Cerithium Duboisi* M. Hoern; *Cerithium nodoso-plicatum* M. Hoern; *Cerithium* cfr. *disjunctum* Sow.; *Rissoa inflata* Andrz.; *Rissoa angulata* Eichw.; *Bulla Lajonkairieana* Bart.; *Hydrobia ventrosa* Montf.;

³ Natalia Paghida, *op. cit.*, pp. 383 sq.; idem, *La microfaune du tortonian de la rive droite du Prouth*, in AȘU — Iași, I, VI, fasc. 2, 1960, pp. 345—354; N. Macarovici et P. Jeanrenaud, *Revue générale du Néogène de plate-forme de la Moldavie*, in AȘU — Iași, tom IV, fasc. 2, 1958, pp. 429—450.

⁴ I. Simionescu, *Denumirea citorva fosile terțiare din nordul Moldovei*, in *Ac. Rom., Publicațiunile fondului „V. Adamachi”*, II (1901—1906), București, 1906, pp. 5—8.

⁵ Emilia Saulea, *op. cit.*, pp. 512 sq.

⁶ Idem, pp. 58 sq.

⁷ I. Simionescu, *Asupra unui calcar sarmatic din nord-estul României*, in *Buletinul Societății de Științe din București* (1899), nr. 6, pp. 792—796.

⁸ I. Simionescu, *op. cit.*, 1906, pp. 8—20.

⁹ I. Simionescu, *Constituțiunea geologică a țărmului Prutului din nordul Moldovei*, in *Ac. Rom., Publicațiunile fondului „V. Adamachi”*, II (1901—1906), București, 1906, pp. 40 sq.

¹⁰ Idem, *Comunicare asupra calcarului sarmatic de la Stînca*, in *Buletinul Societății de Științe din București*, an VII (1899), nr. 6, pp. 796 sq.

Geochronological scale (after Emilia Saulca)

		AGES	SUBDIVISIONS	
P A L E O Z O I C	70 million years	Quaternary	Holocene	Postglacial Würm Riss Mindel Günz Donau
		1 million years	Pleistocene	
		Neogene	Pliocene	
		28 million years	Miocene	
		Paleogene	Oligocene	
		47 million years	Eocene	
			Paleocene	
			Upper Cretaceous	
			Lower Cretaceous	
			Neojurassic	
M E S O Z O I C	150 million years	65 million years	Mesojurassic	
		Jurassic	Eojurassic	
		45 million years	Neotriassic	
			Mesotriassic	
		Triassic	Eotriassic	
		40 million years		
		Permian	Upper	
		25 million years	Middle	
			Lower	
			Middle	
P A L E O Z O I C	335 million years	Carboniferous	Lower	
		55 million years	Neodevonian	
		Devonian	Mesodevonian	
		55 million years	Eodevonian	
		Silurian		
		40 million years		
		Ordovician		
		80 million years	Neocambrian	
		Cambrian	Mesocambrian	
	Eocambrian			
PROTEROZOIC : ± 1 500 million years				
ARCHAIC : ± 2 500 million years				

Trochus podolica Eichw. ; *Macra variabilis* Sinz. ; *Cardium irregulare* Eichw. ; *Cardium latesulcatum* Münt. ; *Syndosmya reflexa* Eichw. The oolitic sandstones at the Piriul lui Istrati stream, with gasteropoda and foraminifera, must also be considered as a Sarmatic layer¹¹.

In conclusion, specialized researches establish that the neogenous series is placed transgressively on the erosional surface of chalky marls with siliceous concretions of Cretaceous age. It comprises :

1. sands with alternations of marlous clays, the upper part with oolitic limestone banks of the Upper Miocene (Sarmatian), with a fauna composed of 50 species of Lamellibranchiatae and gasteropoda ;

2. marls with few sand insertions, but comprising 11 genera and 40 species of Lamellibranchiatae and gasteropoda ;

¹¹ *Idem*, *op. cit.*, 1906, pp. 40—47.

3. marls and limestones with silex nodules and *Lithothamnium* fragments;

4. sands more or less cemented by rolled blocks of silex or gritty limestones¹².

More intensely investigated, beginning with the end of the 19-th century, the Quaternarian is well enough represented. As it is known (Table 1), the Quaternarian comprises two subdivisions: the Holocene and the Pleistocene the latter being divided into three periods: lower, middle and upper.

The Lower Pleistocene is better represented by deposits at Tulucești village. In the sands there, Sava Athanasiu discovered several molars of *Mastodon borsoni* Hays., *Mastodon arvernensis* Cr. et Job., *Ecklephas planifrons* Falc., representing the interface between the Pliocene and Pleistocene¹³.

The Middle Pleistocene comprises the lacustrine deposits in the South East Moldavia, between the Siret and the Prut rivers, which are called „Barboși-Babele layers“. These layers are represented by clays and sands in which the following species were found: *Didacna pontocaspica* Al. Pavlov, *Corbicula fluminalis* Mül., *Corbicula jassiensis* Cob., *Pisidium covurluiensis* Cob., *Pisidium Jassiensis* Cob., *Cristaria (Hysiospis) problematica* Cob., *Adacna plicata* Eichw., a large number of *Vivipara* species: *Vivipara romalci* Cob., *Vivipara gelicus* Al. Pavlov, *Vivipara diluviana-gracialis* Junk., *Vivipara Calvesti* Neum., then *Melanopsis acicularis* Per., *Hydrobia grandis* Cob., etc.¹⁴.

The Upper Pleistocene deposits are to be found on the lower river terraces. Their sediments include the following mammalia: *Elephas primigenius* Blum., *Rhinoceros tichorhinus* Cuv., *Bison priscus* Boj., *Bos primigenius* Boj *Megaceros euryceros* Aldrow., *Equus* sp., etc.¹⁵.

The Quaternary is characterized by the four glaciations: Günz, Mindel, Riss and Würm. During that time, in the periglacial areas, fluvial erosion phenomena resulted in the present river network with their alluvial deposits. During the glaciations, the river flow was low, water energy reduced, water could not transport the material, so wide alluvial plains were formed. Between glaciations, the flow increased and so did water mechanical energy. so that the river dug a new bed in its own deposits while the former bed remained suspended, thus forming a terrace.

The same process might have repeated during the next glaciation or the next stage of the same glaciation, thus forming a whole system of terraces.

The Prut river is the most important tributary of the Lower Danube basin. It springs from the Wooded Carpathians in the Ukraine and flows into the Danube east of Galați.

Its valley is divided into three sectors:

1. the subsequent valley sector, north of Rădăuți;
2. the epigenetic sector between Rădăuți and Stînca-Ștefănești;
3. wide major bed valley sector, south of Ștefănești¹⁶.

¹² Emilia Saulea, *op. cit.*, pp. 43—44.

¹³ N. Macarovici, *Geologia cuaternarului*, București, 1968, pp. 207 sq.

¹⁴ *Ibidem*.

¹⁵ *Ibidem*, pp. 207—209.

¹⁶ V. Băcăuanu, *Observații geomorfologice asupra văii Prutului dintre Rădăuți și Stînca-Ștefănești*, in *AȘU — Iași, Serie nouă, Secția II-a (științe naturale)*, VII, 1961, 2, pp. 432 sq. Gh. Năstase, *Valea Prutului*, in *Revista Geografică*, II, 1946, 1—4, pp. 55 sq.; I. Simionescu, *op. cit.*, 1906, pp. 32 sq.

Geologically, in the epigenetic sector, the Prut sectioned the oldest formations occurring in the Moldavian Plateau¹⁷. Thus, after sectioning the marl-argillaceous system with Volhinian sandy insertions (the Lower Sarmatian), the Prut cut deep through Buglovian deposits, in the north represented by the marl-argillaceous facies, and to the south, between Liveni and Stinca-Ștefănești, by reefy limestones (toltry) occurring only locally, laterally turning into marls. After passing through the Buglovian deposits, the Prut sectioned the Tortonian deposits, characterized by gypsums that come to light on the right bank, at Ivăncuți and Cuzlău, quartziferous sands with silex nodules, between Rădăuți and Miorcani, as well as by chalky-marlous facies, towards Liveni.

Between Rădăuți and Mitoc only, the Prut sectioned older, cenomanian-senonian deposits, belonging to the Upper Cretaceous, composed of chalky marls¹⁸.

Even in that sector it has two distinct subsectors:

- a) between Rădăuți and Mitoc, the valley has a narrow transverse profile, without upper terraces on the right bank and without limestone bars;
- b) south of Mitoc, the valley is wider, with terraces and reefy limestones (toltry).

As for the terraces, owing to the meandered course, at the level of the 130–140 m terrace, those forms of relief pass successively from one side to the other. Therefore, as early as the lower Pleistocene, the territory on which the Prut ran was relatively even, slightly slanted, characteristic of the plain zones¹⁹.

The latest and most comprehensive synthesis study in the field is that carried out by Prof. V. Băcăuanu, who mentions that on the right bank of the Prut Valley there are sectors where there is no terrace. There are other places where only few terraces of various altitudes can be seen, but there are also sectors where the terrace series is complete or almost so²⁰.

In the area under consideration, the zone where most of the terraces are well represented is west and south west of Ripiceni. As above mentioned in the epigenetic sector of the Prut Valley, V. Băcăuanu distinguished four terraces whose relative altitudes are 10 m, 50–60 m, 90–100 m, 130–140 m, plus the fragmented terrace of 20–25 m, and the ones of 30–35 m and 110 m occurring in only one place²¹.

Terrace 1, of 10–15 m, is the latest, except for the floodland terraces of 3–4 and 4–6 m. Fragments of that terrace occur between Rădăuți and Manoleasa in some of the meanders, such as those at Miorcani, Cotu-Miculinti,

¹⁷ I. Simionescu, *op. cit.*, 1906, pp. 31 sq.; I. Atanasiu et N. Macarovici, *Les sédiments miocènes de la partie septentrionale de la Moldavie (Départ. de Dorohoi, de Botoșani et de Jassy)*, in *An. du Comité géologique, Tome XXIII*, București, 1950, (after V. Băcăuanu, *Cîmpia Moldovei Studiu geomorfologic*, București, 1968, pp. 433 sq.); N. Macarovici et P. Jeanrenaud, *Revue générale du néogène de plateforme de la Moldavie*, in *AȘU – Iași*, secț. II-a, tom. IV, 1958, 2, pp. 429–450.

¹⁸ V. Băcăuanu, *op. cit.*, 1961, pp. 433–434.

¹⁹ Idem, pp. 434 sq.

²⁰ Idem, *op. cit.*, 1968, pp. 148 sq.

²¹ *Ibidem*.

Crasnaleuca, north of Mitoc, Iorga. Between Manoleasa-Prut and Stinca – Ripiceni, this terrace is widely developed, being present on both banks of the Prut river, about 1 km wide south of Movila Ruptă, and has all morphological elements well preserved.

Its geological structure can be established both through natural existing apertures and through special drillings. South of Rîșca, above the average level of the river bed, the minor bed side comprises blue marls coming apart into plaquettes and yellow-brown clay. These deposits making up the base of the terrace, are 3 m thick, above them there is a 1.5 – 2 m layer of sand and gravel, then 6 – 7 m sandy clays and the present soil, 1 m thick.

As far as the geological characteristics of this terrace, are concerned, thorough studies showed that the thickness of the sands and gravels varies from 1 m to 5 – 6 m and in its base, besides clays and marls, there are lenticular or blockshaped reefy limestones. Such a composition was studied near the village of Bold, next to the paleolithic station at Ripiceni-Izvor, where the Volovăț stream cutting through the deposits of the lower terrace of the Prut river, epigenetically uncovered the Buglovian limestones in the terrace base. Studying the geological composition of the 10 – 12 m terrace at this point, it was established that, on the surface, the soil is 30 – 40 cm thick, then there follow sandy clays, 6 – 7 m thick, then gravels and sands, 2 m, and the Sarmatian base comprising clays, marls and limestones. The gravel in the base of the terrace is very much similar to that in the base of the present plain, comprising 70 – 80 % silexes, then grit stones, marls or chalky elements²². The colour of the silex is predominantly dark. The silexes in the terrace base were found to have been brought there from the Tortonian deposits north of Mitoc.

Taking into account the paleontological elements found in the alluvial deposits in this terrace, it has been concluded that the Tortonian and the Cretaceous in the North side of the epigenetic sector of the Middle Prut valley sectioning began during the Upper Pleistocene (Würm), which is another reason for dating the terrace during the Würm²³.

At Ripiceni, *terrace 1* is extremely important because in its deposits the noted paleolithic station „La Izvor“ is located. It contains traces from the Premusterian to the Upper Paleolithic.

Terrace 2 has a relative altitude of 20 – 30 m and an aspect of relatively narrow steps. They have been subjected to erosion or turned into colluvies and are present at the base of the right side of the Prut valley. The terrace can also be seen, isolated, at Cotu Miculinți, Crasnaleuca, Mitoc, Sadoveni-Bold, Ripiceni and downstream.

Geologically, above the Sarmatian base, there are layers of alluvial deposits from 3 to 15 m thick. Sometimes, the terrace may occur above *terrace 1*, in this base its case could not be seen, but it lays under the *Terrace 1* bridge.

In point of dating it, this terrace (for the first time described by R. Sevastos²⁴) is also considered as dating back to the Upper Pleistocene, there-

²² Idem, pp. 151 sq.

²³ N. N. Moroșan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est*, in *AIGR* XIX, București, 1938.

²⁴ R. Sevastos, *Depozitele cuaternare din șesul Prutului și al Jiției*, in *AIGR* (1915–1920) IX, 1922, pp. 195 sq.

fore the Würm – this hypothesis is supported by the Würm characteristic fauna found within its deposits.

Terrace 3 has not yet been identified so far into the epigenetic sector of the Prut river²⁵.

Terrace 4, relative altitude about 60 m, is well represented in the Middle Prut Valley.

At Mitoc – Piriul lui Istrati and Malul Galben, there were uncovered, by excavations, important traces of Paleolithic and Postpaleolithic inhabitations.

In point of geological structure, its front could be distinguished quite easily, the terrace bridge reaching up to 1–1.5 km wide. It occurs quite clearly between Mitoc and Liveni, then at Manoleasa-Prut, Ripiceni and downstream. Studies mention that, at Mitoc, the thickness of the alluvial deposits is much diminished. Thus the gravel occurs just on the margin and the bridge of terrace 4 or in the beds of such tributaries as the Piriul lui Istrati. Here, the average thickness of terrace alluvia is about 10 m. Because its base is 35 m high, the morphologic altitude is 50–60 m.

Concerning this terrace, N. N. Moroşan earlier considers it to have a relative altitude of 35–50 m²⁶. A recent interpretation has established it at, 50–60 m or 50–70 m²⁷.

At the base, this terrace is made up of gravels and sands with gritstones, silicious marls, brown quartzites, then loessoid clays over 10 m thick.

In point of age, R. Sevastos²⁸, N. N. Moroşan²⁹, and V. Băcăuanu³⁰ relying upon paleontologic criteria, consider it to be Rissian.

It is interesting to notice that, both at Stinca-Ştefăneşti and northward toward Ripiceni and Liveni, the upper limit of the trolley is beneath the level of the alluvial base of terrace 4. This observation led to the conclusion that the limestone rocks were epigenetically exhumed after the terrace had been constituted, and only afterwards did the river begin to deepen and restrict its reefy limestone bed³¹. Taking into account that the terrace is of Rissian age and the lower terraces are Würmian, one may conclude that the epigeny of the Prut river began after terrace 4 constituted itself as a geomorphological step, that is during the Riss – Würm. Before that, the Prut river had a usual valley.

Terrace 5, with a relative altitude of 90–100 m, has not so far been found in the epigenetic sector, that is between Ripiceni and Miorcani.

Terrace 6 has a relative altitude of 100–110 m and was found at Ripiceni and south of the village, being absent north of the village. Around Ripiceni, terrace 6 was identified in the sites called Dealul Sărăturii and Dealul la Odaie. There being no complete apertures, the whole geologic structure of the terrace could not be established.

²⁵ V. Băcăuanu, *op. cit.*, 1968, pp. 152 sq.

²⁶ N. N. Moroşan, *op. cit.*, 1938, *passim*.

²⁷ V. Băcăuanu, *op. cit.*, 1961, pp. 435 sq.

²⁸ R. Sevastos, *op. cit.*, pp. 495 sq.

²⁹ N. N. Moroşan, *op. cit.*, 1938, *passim*.

³⁰ V. Băcăuanu, *op. cit.*, 1968, pp. 157 sq.

³¹ *Ibidem*.

We have so far found out that terrace 6 is rendered evident through a horizon of gravel made up of gritstones, quartzites, menilites, and fragments of marls. The terrace bridge is impregnated with colluvies and has the aspect of a flat piece of land of an absolute altitude of 170–180 m.

In conclusion, the terrace, considered to be of Mindelian age by R. Sevastos³², is strongly eroded.

Terrace 7, the highest in the whole Moldavian Plateau, has a relative altitude of 140 m. It has been destroyed almost entirely, occurring only under the form of some layers of gravel come to light on the sculptural surface of certain hills. The gravels of the terrace have the same structure as the lower terraces, but larger sizes, up to 5–7 cm. This terrace, too, has so far been found about Ripiceni, at Dealul Sărăturilor/Hirtopul Sărăturilor and Dealul la Odăi. Based upon its altitude and other criteria, it was dated back to the Upper Pleistocene.

Table 2

The Prut terrace situation in the epigenetic sector (after V. Ilăcănuș)

Terrace	Absolute Altitude	Relative Altitude Base	Alluvia Thickness	Morphological Altitude Thickness	Age
Plain	80	—	—	0	Holocene
T I	90	1–3	9–10	10–12	Q III-H
T II	100	8–10	10–15	20–25	Q ² III
T III	—	—	—	—	—
T IV	125–130	35–40	10–15	50	Q II
T V	—	—	—	—	—
T VI	175–180	90–95	5–10	100	P IV–Q 1
T VII	200–220	120	0–20	130–140	P IV

THE SUCEAVA PLATEAU

The Suceava Plateau is situated west of the Moldavian Plain, north west of the Moldavian Plateau, being its highest geographical sub-unit. Its limit to the Moldavian Plain is marked by the cuestaslike steep slopes on the line uniting the towns and villages of Dorohoi—Botoșani—Copalău—Flămînzii—Hirlău—Cotnari—Țirgu Frumos—Strunga—Hîndrești, and to the Central Moldavian Plateau the limit is marked by the line Hîndrești—Stănița—Sagna³³.

The relative average altitude is 350–500 m, alternating with hilly areas still higher, more than 600 m (Dealul Ciungi), with the Siret or the Moldavian and Suceava flood plain (under 300 m) and with wide saddle lands (Bucecea, Ruginoasa)³⁴.

³² R. Sevastos, *op. cit.*, pp. 495 sq.

³³ V. Băcănuș, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *Podișul Moldovei*, București, 1980, pp. 261 sq.

³⁴ V. Tufescu, *România*, București, 1974, pp. 154 sq.

Its geological deposits comprise an alternation of clays, sandy clays and sands with various monoclinated levels of marls, sandstones, oolitic limestones and conglomerates, belonging to the Sarmatian³⁵. These are all covered by Quaternary deposits, situated especially along the main valleys (terraces), the interfluvial areas being covered with alluvial and colluvial loessoid clays.

The presence of most Paleolithic stations with Gravettian inhabitations are situated on the structural plateaux and not on river terraces. It is also evident in the widespread development of the structural relief which is due to the horizons with sandstones, limestones and conglomerates delaying or reducing the erosion processes. Best known are those in the high area of the Dragomirna Plateau, such as Calafindești—Poiana Trei Meri — Dealul Vărădia — Pădurea Dragomirna, Călinești—Adincăta—Mitoc—Burdujeni, the hills of Liniei, Pleșa, Dolhești, Bosanci, Ciritei (on the Fălticeni Plateau), and the high plateaux in the areas of Ruginoasa, Vascani, Hărmanesti, Todirești, Stroești etc. Owing to the geologic substratum, by which the subsequent shaping of the relief was established, the cuestas and cuesta-like steep slopes are relatively numerous, with no remains of Gravettian habitations. The ones in the south of the Moldavian Plateau have been identified by M. Brudiu³⁶.

The accumulating relief is represented by floodplains and river terraces. These have been identified on various levels. Thus, the floodplain of the Siret river is 2—4 km wide. It is made up of alluvium 6—12 m thick, comprising lower gravels and sands covered by clay-sandy deposits. The same features were found in the floodplain terrace of the Suceava river, its width being smaller: 1—1.5 km³⁷.

Along its course in the Moldavian Plateau, the Siret, the main river on the Suceava Plateau, has nine terraces with the following relative altitudes: 7—9 m, 12—20 m, 25—40 m, 80—90 m, 100, 120 m, 130—150 m, 170—190 m, 200 m³⁸. Certain geologists believe that besides the major bed, the Siret river has only seven terraces, whose relative altitudes are given as 12 m, 20 m, 40 m, 70 m, 100 m, 150 m and 170 m³⁹.

Among its tributaries in the Suceava Plateau, the Suceava River has eight terraces that have been charted. Their relative altitudes are 20 m, 30 m, 50 m, 70 m, 100 m, 120 m, 150 m, 180—190 m. The 70 m and the 100 m ones, belonging to the Lower Pleistocene, and the higher ones, are older⁴⁰. As for as the Carpathian tributaries of the Siret, are concerned, the

³⁵ V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, pp. 263 sq. Al. Roșu, *Geografia fizică a României*, București, 1980, pp. 406—407.

³⁶ M. Brudiu *Paleoliticul superior și epipaleoliticul din Moldova*, București, 1974, *passim*.

³⁷ V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, pp. 264—265.

³⁸ T. Morariu, I. Donisă, *Terasele fluviale din România*, in *Studii și cercetări de geologie, geofizică și geografie, serie geografie*, tom 15, 1961, 1, pp. 6 sq.; I. Sircu, *Valea Siretului în sectorul raionului Pașcani și problema genezei șei de la Ruginoasa. Aspecte geomorfologice*, in *Probleme de geografie II*, 1955; T. Bandrabu, I. Giurgea, *Contribuții la cunoașterea cuaternarului văii Siretului din regiunea Bacău—Roman*, in *Dări de seamă ale ședințelor Comitetului Geologic*, vol. II (1963—1964) II, 1964.

³⁹ I. Sircu, *Terase fluviale, suprafețe de eroziune locală și pseudopenepene în nordul Plătonului Moldovenesc*, in *AȘU — Iași, secțiunea a II-a*, XI, 1965, pp. 106 sq.

⁴⁰ *Ibidem*.

Bistrița River has about 14 terraces in the Eastern Carpathian area, with altitudes of up to 280 m, and outside the Carpathian sector it has only nine accumulating terraces with altitudes up to 170 m⁴¹. Most of the Paleolithic stations in the Ceahlău area are located in the deposits of the terraces of the Carpathian and sub-Carpathian sectors of the Bistrița river. We shall deal with these data in detail in the next chapters.

THE BÎRLAD PLATEAU

The Birlad Plateau is the third unit of the Moldavian Plateau, at the same time being the largest in point of area, occupying the whole region between the Siret and Prut rivers.

Geologically and structurally, the Birlad Plateau is superposed on the south part of the Moldavian Platform and the Birlad Depression. These sub-units comprise the Bessarabian and Kersonian deposits. They are made up of clays, marls, sands associated with sandstone and limestone horizons. Upon these there are, especially in the south, Meotian formations, clayey and sandy, with intercalations of andesitic cinerites. There are also here and there deposits from the Middle Pliocene (Pontian and Dacian).

Above these deposits, the Quaternary deposits were laid down. They belong to the Lower Pleistocene — the Cindești gravel —, with elements of the Eastern Carpathian flysch⁴².

Table 3

The Bistrița terraces in the flysch zone (after I. Donisă)

Gh. Macovei and I. Atanasiu, 1927 Largu—P. Neamț (m)	N. Popp, 1942 Largu—P. Neamț (m)	I. Donisă and Hârjoabă, 1959 Bicaz—P. Neamț (m)	I. Donisă, 1960 Broșteni—Bacău (m)	I. Donisă, 1961 Broșteni—Bicaz (m)	I. Badea and Gh. Popa, 1961 Galucea—Bicaz (m)	I. Ilie, 1962 Largu—Hangu (m)	I. Donisă, 1965 Broșteni—P. Neamț (m)
		1.5— 2 2— 4 5— 7 8— 12 15— 20	1.5— 2 2— 4 5— 7 9— 12 15— 25	1— 2 2— 4 5— 7 9— 12 15— 20 20— 25	1— 2 6— 4 8— 12 15— 17 20— 25	1— 3 6— 4 8— 12 55— 65 80— 100	0.5— 1 2— 1 5— 7 8— 12 15— 20 33— 40 45— 55 65— 70 80— 90 100— 110 125— 130 140— 150 165— 180 240— 250 260— 275
5	5— 10						
10							
15	15— 25						
25							
30							
40				35— 40	35— 40		
50	50— 70	50— 70	40— 60	40— 50	55— 65		
70							
80							
90			80— 100	80— 100	80— 100		
100							
120	90— 140	120— 140	120— 140	120— 140	130— 150		
150	150— 175	160— 180	170— 190				
200	200— 280			180— 200	200— 240		
280			260— 280	260— 280			

⁴¹ T. Morariu, I. Donisă, *op. cit.*, pp. 5—6.

⁴² E. Saulea, *op. cit.*, pp. 778 sq.

A characteristic of the Birlad Plateau, especially of its northern area, is its structural plateaux and cuetas, whose existence is due to horizons of Sarmatian sandstones and limestones. Southwards, owing to the wide area of the sandy facies of the Pliocene, the sculptural hills are predominant⁴³.

The sculptural relief was created by the Prut and the Birlad rivers, their tributaries contributing to the modelling of certain microzones. Thus, in this area of the Moldavian Plateau, the Prut has five terraces with average altitudes of 5–11 m, 18–32 m, 57–58 m, 90–105 m, and 134–140 m⁴⁴. The Birlad River created six terraces of: 20–25 m, 30–40 m, 60–70 m, 100 m, 110–115 m, and 130–135 m⁴⁵. So far, remains of Paleolithic habitation have been identified there.

THE BISTRIȚA RIVER

In the Eastern Carpathians, only the Bistrița terraces in the flysch zone are of archeological interest (from the confluence with the Cotirgași stream to Piatra-Neamț) and outside of its Carpathian sector, downward to about the confluence with the Siret river. Thus, in the flysch zone, the Bistrița has three floodland terraces and 14 slope terraces, with relative altitudes of 5–7 m,

Table 4

The Bistrița terraces outside the Carpathian sector (after I. Donisă)

M. David, 1932 P. Neamț–Racova	I. Donisă, 1960 Broșteni–Bacău	T. Bandrabur C. Opran, V. Mocanu and E. Mocanu, 1964 P. Neamț– Zărnești (m)	T. Bandrabur and P. Giurgea 1965 P. Neamț– Bacău (m)	I. Donisă 1965 P. Neamț–Bacău (m)
(m)	(m)	(m)	(m)	(m)
				0.5–1 1–2
	1.5–2			
	2–4		2–5	2–4
	5–7	5–6	3–5	5–7
	9–12	8–12	8–12	15–25
8–20				
	15–25		20–30	
40–60	40–60	40–45	40–45	35–40
				50–55
80–100	80–100		60–70	75–90
			100–110	100–110
	120–140	120–150		120–130
		150–180		
	170–190		160–170	165–170
	260–280			

⁴³ V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, pp. 289–299.

⁴⁴ I. Gugiuman, *Depresiunea Huși. Studiu de geografie fizică și economică*, București, 1959, *passim*.

⁴⁵ D. Ploscaru, *Podișul Central Moldovenesc. Studiu geomorfologic*, Rezumatul tezei de doctorat, Iași, 1973.

8–12 m, 15–20 m, 35–40 m, 45–55 m, 65–70 m, 80–90 m, 100–110 m, 125–130 m, 140–150 m, 165–180 m, 200–210 m, 240–250 m, and 260–275 m⁴⁶. Almost all the terraces, with average altitudes between 5–7 m and 65–70 m, contain remnants of Aurignacian and Gravettian settlements. We think it necessary to make a brief presentation of the characteristics of these forms of relief.

The 5–7 m terrace is to be found in quite a large area, the best developed being downstream of the confluence with the Hangu Creek. It comprises gravels scarcely covered by clays. The Gravettian habitations at Bicaz may belong to this low terrace, although in that place they are only fragmentarily present.

The importance of this terrace lays in the fact that in its sediments a bluish limestone 23 m high column, called Piatra Teiului, is implanted. The origin of this huge isolated limestone block, its base inserted between sandstone and marl rocks, has not been explained so far.

The 8–12 m terrace is also spread on quite a large area between Cotirgași and Piatra Neamț. It is often subjected to landslide phenomena, or contaminated by evacuating cones or accumulating glacis. Its base comprises gravels partly covered by sandy clays.

The 15–20 m terrace is plainly visible upstream of Stejaru. In the aperture at Lunca, in its abrupt front side, the basic rock appears at a height of 15 m, with superposed gravels (2–3 m) and clays (about 2 m). Sometimes the clays, combined with rugged fragments of sandstone, are over 10 m thick. As in the case of the lower average altitude terraces, these forms

Table 5

The Loessoid clays composition on the 100–50 m terraces
(after I. Donisă)

Place	Sample	0.2–2 mm %	0.02–0.2 mm %	0.002– 0.02 mm %	0.002 mm %	Carbo- nates %	Humus %
Racova	10	1.20	36.20	17.36	41.96	2.56	0.72
	11	1.78	31.37	21.12	45.36	0.08	0.29
Piriul Negel	12	0.22	56.91	29.63	6.60	6.96	0.56
	13	0.60	68.29	17.36	12.52	0.49	0.65
	14	0.21	31.29	27.18	34.70	6.29	0.24
	15	0.08	27.14	34.50	35.60	2.23	0.36
	16	0.03	7.45	21.96	60.90	8.61	0.96
	17	0.10	64.05	14.34	16.14	5.09	0.19
Vatra Dornei	18	4.53	32.63	28.40	32.28	0.16	2
Piriul Dornencii	19	0.45	31.31	43.10	12.46	10.43	2.16
	20	1.13	36.82	36.72	14.68	10.35	0.21
Costișa	21	0.19	44.37	26.36	16.66	12	0.26
Bofu	22	3.47	43.85	20.68	31.64	0	0.36
	23	0.03	36.70	45.26	17.20	0.12	0.60
Ceahlău	24	1.54	43.27	22.52	32.12	0	0.55

⁴⁶ I. Donisă, Geomorfologia văii Bistriței, București, 1968, pp. 122 sq.

of relief are not uniformly present in the whole of the Bistrița valley. Each tributary of the river has its own terraces at various altitudes and of various geological compositions.

The 35–40 m terrace is archeologically the most important. At Bistrița-Lutărie, Dîrțu, etc., the Aurignacian and Gravettian groups established their habitations on these relatively high grounds. Sometimes the basic rock has about 30 m altitude, above it 7–8 m gravels mixed with crystalline and andesite elements. We must mention that downstream of Bicaz this terrace is altogether absent.

Table 6

The composition of the loessid clays on the 40–25 m terraces
(after I. Donișă)

Place	Sample	0.2–2 mm %	0.02–0.2 mm %	0.002– 0.02 mm %	0.002 mm %	Carbo- nates %	Humus %
Mărceni-Bicaz	25	6.01	63.22	12.92	7.88	8.25	0.72
Dumbrava Roșie	26	0.31	15.58	44.20	30.36	8.83	0.72
	27	0.99	58.28	19.60	12.76	7.75	0.72
Valea lui Ispir	28	0.14	56.28	23.50	19.30	0.00	0.48
	29	1.48	44.88	27.84	16.72	9.08	0.00
	30	0.39	42.02	27.12	25.56	4.46	0.55
Pășcăreni	31	2.37	77.72	11.14	3.00	4.67	1.00
	32	0.29	47.95	31.95	11.74	3.06	0.82
	33	0.23	37.42	41.46	19.00	0.00	0.86
Lilieci	34	0.43	43.98	29.52	19.40	6.02	0.65
	35	0.37	40.81	22.16	33.16	2.06	1.44
	36	1.62	35.98	23.30	21.54	17.08	0.48
	37	0.70	30.57	27.60	39.84	0.33	0.96
Capul Piscului	38	0.00	46.58	18.96	29.12	6.02	0.12
	39	0.72	64.86	15.31	16.14	1.82	1.08

The 45–55 m terrace appears as fragmentated as the previous one. It has the same geologic composition as a whole, based on cemented gravels at the base, then another level of gravels, sometimes mixed with boulders of up to 20 cm diametre, brown clay with fine gravel and, finally, the yellow clay which has come to light⁴⁷.

The higher Bistrița terraces do not contain many Paleolithic habitation remains. A detailed account of their characteristics is not archeologically important, but for the one with a relative altitude of 65–70 m, in whose sediments could be identified proofs of the Paleolithic man's presence. This relief level is made up of the base rock (25–30 m thick), then of about 20 m of gravels superposed upon 10–20 m of clays. Within the 125–130 m terrace, there were uncovered remains of a Gravettian habitation at the site called Cremeniș⁴⁸. Its geologic structure could not be precisely determined.

⁴⁷ *Ibidem*, pp. 128–130.

⁴⁸ *Ibidem*, pp. 130–132.

**Relative altitude of Bistrița terraces
(after I. Donisă)**

The Crystallino-Mesozoic Sector (m)	The Flysch Sector (m)	The Extra-Carpathian Sector (m)
0.5— 1	0.5— 1	0.5— 1
1— 2	1— 2	1— 2
2— 3	2— 4	2— 4
5— 7	5— 7	5— 7
	8— 12	
	15— 20	15— 25
10— 17	35— 40	35— 40
20— 30	45— 55	40— 55
45— 50	65— 70	75— 90
65— 70	90— 80	75— 90
80— 90	100—110	100—110
100—110	125—130	120—130
125—130	140—150	120—130
140—150	165—180	165—170
	200—210	
	240—250	
	260—275	

Table 8

**Terrace levels in the Bistrița valley
(after I. Donisă)**

Level	Relative altitude of terraces				
	Upwards Zugreni (m)	Between Chiril and Broșteni (m)	In the Zone of flysch (m)	In the extra-Carpathian sector (m)	The Siret Terraces in the Confluence Zone (m)
1a	—	—	5— 7	—	—
1b	—	—	8— 12	—	—
1c	—	3— 4	15— 16	5— 7	—
1d	—	5— 6	20— 22	15— 5	5— 7
2	10— 17	15—20	20— 24	6 ?	10— 15
3	20— 30	25—40	35— 40	35— 40	35
4	40— 50	50—60	60— 70	70— 75	70— 90
5	50— 70	75— 80	90—100	100—105	110—115
6	60— 80	100	100—110	—	—
7	75— 90	110	115—130	120 ?	—
8	90—100	125	135—140	140 ?	—
9	95—125	—	160—170	160—165	165—170
10	125—130	—	175—180	—	—
11	140—145	—	210—225	—	—
12	—	—	240—243	—	—
13	—	—	255—275	—	—

In its extra-Carpathian extension, the Bistrița river has 8 terraces with average altitudes of 5–7 m, 15–25 m, 35–40 m, 50–55 m, 75–90 m, 100–110 m, 120–130 m, and 165–170 m⁴⁹.

The 5–7 m terrace dominates the floodplain, sometimes with widths of up to 400 m, being made up of a layer of gravels with clays superposed.

The 15–25 m terrace reaches, downstream of Piatra Neamț, up to 3 km in width. Its average altitude varies. It is composed almost entirely of gravels in some places covered by clays, which makes it unfit for settling purpose.

The 35–40 m terrace is extremely well-developed downstream of Piatra Neamț, where it reaches up to 3–3.5 km in width. It is made up of gravels whose base descends under the bridge of the 15–25 m terrace. It is covered by a layer of clays 8–10 m thick. It has been identified at Blăgești-Bacău, too, where the Paleolithic settlement at Buda is located.

The 50–55 m terrace is not so well represented outside the Carpathian sector, its morphologic characters being sometimes hard to find.

The 75–90 m terrace is, archeologically speaking, the last formation which might contain habitation remains belonging to the Upper Paleolithic. Its geological structure is not uniform and depended on the environmental conditions at the time of its formation. Generally, at the base it has the same layer of gravels with elements of the flysch zone, on which there superposed various clays of diverse colours and consistencies together with whitish argils.

SUMMARY

In conclusion, the altitude, number, distribution and criteria of terraces formation in the geographic area under consideration presents both common features and certain distinctions depending on a diversity of factors. The terraces on the Moldavian Plateau are clearly distinct from the Bistrița ones in the intra-and extra-Carpathian zones.

Most of the river terraces that have been identified in the Moldavian Plateau have a relatively uniform geologic structure. At their base, we have found limestone sediments (Sarmatian or Pliocene) on which gravel and sand deposits are superposed. These are, in their turn, covered by loessoid clays. In the terraces created by rivers originating in the mountains, the Carpathian elements are unmistakably present into the geologic substratum.

Various studies have shown that, quantitatively and qualitatively, loessoidal clays in the lower and middle terraces are alluvial in origin. These sediments were deposited during interglacial periods, while the fossil soils seem to belong to short periods, when the depositing of the alluvia ceased, corresponding to climate changes between the glaciations⁵⁰.

Among other relief forms used by early populations in the late Paleolithic period, are the plateaux bordered by sculptural interfluvia with an aspect of gentle-sloped hills.

⁴⁹ *Ibidem*, pp. 143–153.

⁵⁰ V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, pp. 61 sq.

The process of modelling relief was the main factor of the complex mechanism of the general and relatively uniform sculpturing of the Moldavian Plain, Suceava Plateau and Central Moldavian Plateau. Thus, there appeared the various erosion platforms, individualized as wide levels of differently modelled relief. Located nearby, were widely developed valleys and important rivers, even some less important but permanent tributaries.

These relief forms offered early population groups extremely favourable ecologic conditions. Gravettian hunters' camps, especially in the final stages of the development of that culture, seem to pertain to such relief in the areas under consideration.

CLIMATE

The climatic peculiarities of the geographical areas under study vary. Thus, the Suceava Plateau lies under the influence of predominant north west winds with relatively high rainfall and moderate average temperatures. The Moldavian Plain is situated under the influence of the eastern winds. The average temperature is higher than in the Suceava Plateau region. The Birlad Plateau is more under the influence of the Euro-Asian currents which give it a more continental climate: contrast between maximum temperatures in January and July, rainfall, etc.⁵¹. A rougher climate is to be found in the Ceahlău area. The average yearly temperatures are only 5—6°C⁵². The ecologic conditions offered by the Bistrița Valley determined the inhabitation of its terraces during the whole Upper Paleolithic.

HYDROGRAPHY

The hydrography of the region is characterized by the presence of two main rivers: the Prut and the Siret, as well as of the tributaries of the latter: the Suceava, the Moldova, the Bistrița, the Birlad, etc. They have created numerous valleys crossing not only the Moldavian Plateau, but also the Carpathian and sub-Carpathian areas. The hydrographic basins of the Prut and the Siret comprise the rivers draining the Moldavian Plateau and part of the Eastern sub-Carpathians and Carpathians. Their basic levels seem to have been constituted by a Pliocene-Quaternary paleolake in the South-East of the country and then by the Danube and the Black Sea⁵³.

The Prut basin, in its epigenetic sector, contains the most complete stratigraphic profile of the Romanian Paleolithic. It is superposed on the Moldavian Plateau which is gradually eroded from north to south, beginning with the Sarmatian up to the end of the Pliocene⁵⁴. The Bistrița River, on whose terraces (in the Răpciuni basin and downstream) were discovered complete series of Upper Paleolithic habitations, created its minor bed in alluvia represented by various categories of gravels and block stones, as

⁵¹ *Ibidem*, pp. 406 sq.

⁵² Al. Roșu, *op. cit.*, pp. 254—246.

⁵³ T. Morariu, I. Donisă, *Terasele fluviale din România*, in *Studii și cercetări de geologie, geografică și geografie*, serie geografie, tom 15, 1961, 1, pp. 6 sq.

⁵⁴ *Ibidem*.

well as in the base rock of various hardness, which determined the appearance of rapids; and, by sedimentation the Bistrița created its own system of terraces⁵⁵.

SOIL TYPES

The Moldavian Plateau soils, both in the Carpathian and sub-Carpathian areas, are varied. This intrazonal variety depends on numerous factors: origin (wind or water erosion, mountain, plateau or plain, etc.), manner, duration and period of sedimentation, weather and vegetation conditions and alteration processes. The relief also has an extremely important role. The specialized literature⁵⁶ mentions: a) podsol soils, characterized by an upper alluvial horizon, 20–35 cm thick, and an intermediate, clayey — illuvial horizon, 1–1.25 m thick, with large quantities of clay; b) brown soils, very frequently present in the Suceava Plateau and the north west of the Birlad Plateau; c) grey soils, very frequent in the south east of the Tulova Hills, on the hills of Crasna and Fâlcu, and also on the terraces of the Siret, the Suceava and the lower Moldova; d) leached chernozem whose origin is relatively controversial (most of the specialists considering it originated during the Holocene); e) alluvial and colluvial soils, mostly found in the floodplain terraces and at the base of the slopes; f) loessoid soils.

If the Paleolithic settlements at Mitoc — Malul Galben and Pîrîul lui Istrati are colluvial, then these soils could have their origin in the Würmian. Loessoid formations are present in all the terraces of the main and secondary rivers. They are archeologically the most important, because they preserve the human habitation remains of the whole Paleolithic age and paleofaunistic materials. By palynologic analyses, significant data have been obtained concerning the vegetal cover specific to each cultural and climatic sequence. These soils are also present on the Bistrița terraces. Their study has already contributed to knowing periglacial phenomena specific to several geographic areas on our country's territory. Thus, it was found that the phenomena caused by the periglacial climatic conditions gave the whole Bistrița valley sector, including the terraces, specific features, such as the „ice wedges”⁵⁷.

⁵⁵ I. Donisă, *op. cit.*, *passim*.

⁵⁶ V. Băcăuanu, *op. cit.*, 1968, *passim*; I. Donisă, *op. cit.*, *passim*; V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, *passim*; R. Călineanu, *Biografia României* București, 1969; C. Chiriță, *Ecopedologie*, București, 1974; C. Chiriță, C. Păunescu, D. Teaci, *Solurile României*, București, 1967; N. Florea, I. Munteanu, C. Rapaport, C. Chițu, M. Opreș, *Geografia solurilor României*, București, 1963; Bica Ionesi, *Stratigrafia depozitelor miocene de platformă dintre Valea Siretului și Valea Moldovei*, București, 1968; V. Miclăuș, *Solurile podzolite și solurile podzolice*, București, 1970; N. Rădulescu, I. Velcea, N. Petrescu, *Geografia agriculturii României*, București, 1968; V. Tufescu, *Modelarea naturală a reliefului și eroziunea accelerată*, București, 1966, etc.

⁵⁷ C. S. Nicolăescu-Plopșor, *Les phénomènes periglaciaires et la géochronologie du Paléolithique supérieur en Roumanie*, in *Dacia*, N.S., II, 1958, pp. 384–391; idem, *Fenomenele periglaciare și stratigrafia paleoliticului*, in *SCIV*, 12, 1961, 1, pp. 65–74; C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Moroșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 7 sq.; I. Donisă, *op. cit.*, pp. 229 sq.

The mammalogic and malacologic fauna belonging to various geologic stages has been carefully studied since as early as the beginning of the 19-th century. Correlations between certain fauna species and the age of the deposits have been ascertained as they have much bearing on the Paleolithic period⁵⁸.

We also mention that, as a consequence of drawing up the archeologic compendia of Iași and Botoșani counties, numerous fossiliferous sites were registered⁵⁹. Several studies have been made by special — ists dealing with the Paleolithic in the Romanian East-Carpathian area, including the Bistrița drainage⁶⁰.

Various species and even faunistic associations have been found either in clays and sands at the base of some of the terraces, or in the loessoid deposits on top of them. During the three Würm stades and interstades were discovered: a) a cold climate faunistic complex which included mammoth, furry rhinoceros, polar fox, bison, various species of horse, saiga, steppe lemming, etc.; b) a moderate climate complex (interstadial) with species of deer, wild boar, wild roebuck, aurochs, wild donkey⁶¹.

⁵⁸ I. Simionescu, *op. cit.*, 1906, pp. 27 sq; idem, *Creta superioară și calcarul cu Lithothamnium pe valea Prutului (jud. Dorohoi)*, in *Arhiva Societății Științifice și Literare din Iași*, VII, 1897, pp. 82—85; idem, *Ein Profil aus dem Nodöstlichen Teile der Moldau*, in *Verhandlungen der K. K. geol. Reichsanstalt*, 11, 1897. N. N. Moroșanu, *Noi contribuții preistorice asupra Basarabiei de nord*, in *Ac. Rom., Memoriile secțiunii științifice*, S. III, tom. VI, mem. I, 1929, pp. 1—17; idem, *op. cit.*, 1948; Ioan C. Botez, *Date paleolitice pentru stratigrafia loessului în nordul Basarabiei* in *Ac. Rom., Memoriile secțiunii științifice*, III, tom. VII, mem. 5, 1940, pp. 107—117; N. Macarovici, *Elephas trogontherii Pohlig de Holboca — Jassy (Roumanie)*, in *Folia Quaternaria*, XII, Krakov, 1964, pp 1—10; idem, *Mamutul (Elephas trogontherii Pohlig de la Holboca — Iași, in Comunicări de Geologie*, II, 1964, pp. 155—168; idem, *Asupra unor mamifere fosile din sarmatianul Podișului Moldovenesc*, in *Bul. Societății de Științe Geologice din R.S. România*, X, 1968, pp. 217—227; idem, *Nouvelles données sur quelques Cétacés du Sarmatien inférieur du Nord de la Moldavie*, in *Travaux du Museum d'Histoire Naturelle Grigore Antipa*, vol. VIII, 1968, pp. 587—590; A. Saraiman, V. Căpitanu, *Prezența lui Mastodon arvenensis Croizet et Jobert în terasa de 160 m a Bistriței*, in *AȘU — Iași (serie nouă)*, sect. II (Șt. Nat.), b, *Geologie—Geografie*, XI, 1965, pp. 97—100; idem, *Prezența lui Elephas meridionalis Nesti în terasa a II-a a Bistriței (Racova — Buhuși)*, in *AȘU — Iași (serie nouă)*, Sect. II (Șt. Nat.), X, 1964; O. Necrasov, M. Bulai-Știrbu, *Contribuții la studiul faunei pleistocene de la Buda (jud. Bacău) cu o privire specială asupra caracteristicilor renului*, in *Carpica*, Bacău, 1971, pp. 7—19; T. Simionescu, N. Trelea, *Fauna de gastropode cuaternare de la Mitoc (jud. Botoșani)*, in *AȘU — Iași (Serie Nouă)*, sect. II, *Geologie—Geografie*, XXVII, 1981, pp. 45—48; T. Simionescu, *Nouvelles espèces de gastéropodes dans la terrasse pléistocène du Prut de Malul Galben—Mitoc (District de Botoșani)*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie* (edit. V. Chirica), Iași, 1987, pp. 114—122; O. Necrasov, M. Știrbu, *Sur les faunes paléolithiques du Nord-Est de la Roumanie*, *ibidem*, pp. 105—111, etc.

⁵⁹ V. Chirica, M. Tanasachi, *Repertoriul arheologic al județului Iași*, vol. I—II, Iași, 1984—1985, *passim*; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, vol. I—II, București, 1976, *passim*.

⁶⁰ C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *op. cit.*, pp. 5—116; V. Chirica, *La genèse et l'évolution des cultures du Paléolithique supérieur dans la zone du Prut Moyen d'après les recherches récentes*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie* (édit. V. Chirica), Iași, 1987, pp. 25—40; M. Brudiu, *Le travail de l'os et du bois de renne dans le Paléolithique supérieur de la zone du Prut Moyen. Répertoire typologique*, *ibidem*, pp. 73—86.

⁶¹ Al. Păunescu, *Evoluția istorică pe teritoriul României din paleolitic pînă la începutul neoliticului*, în *SCI VA*, 31, 1980, 4, pp. 521—522.

On the other hand, the coexistence of species belonging to the two faunistic complexes was found, probably owing to their adaptation to the new environmental conditions: *Mammuthus primigenius* Blum., *Rhinoceros thicohorhinus* Cnv., *Bison priscus* Boj., *Megaceros euryceros* Aldrv., *Equus sp.*, *Felis leo sp.*, *Cervus elaphus* L., *Rangifer tarandus* L., *Equus (Asinus) hydruntinus* Regalia. Based on these faunistic associations, the geologic age of these terraces could be established: T. 5–15 m = Würm III; T. 20–30 m = Würm II; T. 35–40 m = Würm I, the higher terraces belonging to the Middle Pleistocene (50–70 m), to the Pliocene respectively (the ones higher than 100 m)⁶².

FLORA

The knowledge of the flora characteristics in the geographic area under investigation can give an idea of the environment conditions in which Paleolithic populations lived. In this respect, we should mention that the first polynologic tests were done by S. Leclercq in Liège on sample furnished by the famous geologist N. N. Moroşan, taken from the stations that he investigated himself in the Middle Prut area⁶³.

Based on other polynologic tests, it is believed that during the Würm glaciation, the leaf bearing forests diminished their areas very much, surviving only in well sheltered regions, except for certain cold resistant species: pedunculate oak tree, hazel tree, lime, elm, maple, beech, ash, apple, pear which vegetated along with grassy elements of cold steppe. More thermophilic species like the manna ash or the wig tree could not resist the hardships of the climate, migrating to the south of the Danube⁶⁴.

For a better comprehension of the climate and the environmental conditions in which the Gravettian populace lived, the pollen studies give the most significant information. To this account, in order to identify the vegetal landscape and the climate fluctuations during the last thirty thousand years, we shall take into consideration pollen analyses made in various Paleolithic stations located in the Moldavian Plain (Ripiceni), the Succava Plateau (Topile-Valea Seacă, Strachina-Dorohoi), the Birlad Plateau (south of the Moldavian Plateau) (Măluştteni, Bereşti, Puricani) and the mountainous area of the Bistriţa terraces⁶⁵.

In the Middle Prut valley at Ripiceni-Izvor (although there is the possibility of contamination due to the numerous crotonovines)⁶⁶ during the evolved Gravettian period⁶⁷, a vegetation of favourable enough conditions was identified: coniferous species (*Pinus*, *Picea*); foliaceous species (*Ulmus*

⁶² V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.* pp. 60–62.

⁶³ S. Leclercq, N. N. Moroşan, *Contribution à la connaissance de la flore du Pléistocène de la Roumanie du Nord-Est*, in *Comptes rendus des séances de l'Institut Géologique de Roumanie*, XXI, 1933, pp. 111–116.

⁶⁴ V. Băcăuanu, N. Barbu, M. Pantazică, Al. Ungureanu, D. Chiriac, *op. cit.*, p. 130.

⁶⁵ M. Cărciumaru, *Mediul geografic în Pleistocenul superior şi culturile paleolitice din România*, Bucureşti, 1980, *passim*.

⁶⁶ Al. Păunescu, Ana Conea, Marin Cărciumaru, Venera Codarcea, Al. V. Grosu, R. Popovici, *Consideraţii arheologice, geocronologice şi paleoclimatice privind aşezarea Ripiceni–Izvor*, in *SCIVA*, 27, 1976, 1, p. 12.

⁶⁷ *Ibidem*, p. 8.

Quercus, *Alnus*, *Betula*, *Salix*, *Corylus* having less favourable conditions). The steppe climate was favourable to compositae, graminaceae and cyperaceae. This cold climate was specific to the last rigorous Würm glacial stade, when the poplars left the area. They came back during the Herculane II climatic oscillation, that is in a gentler climate⁶⁸.

At the south eastern limit of the village of Ripiceni, another Gravettian settlement was investigated both archeologically and palynologically. The pollen spectra show a certain predominance of the coniferous species which grew here as small woods. A diminution of pine pollen and an increase of the spruce fir pollen seems to demonstrate the existence of a gentle and relatively humid climate, specific to the Românești climatic oscillation, during the Tardiglacial⁶⁹.

On the Bistrița terraces at Țirțu and at Bistricioara-Lutărie, the situation varies due to both the geographical micro-zone and the period in which the Gravettian communities developed.

Thus, on the Țirțu terrace, the pollen profile shows, during the cultural stages considered to belong to the Middle and Upper Gravettian, the coexistence (in highly various quotas) of the coniferous species: *Pinus*, *Picea*, *Abies*, *Larix* and *Taxus*, together with the foliaceous (in smaller proportion): *Fagus*, *Quercus*, *Ulmus*, *Tilia*, *Carpinus*, *Alnus* and *Corylus*, graminaceae and various herbs, the compositae being in smaller numbers. This occurred during the transition from the Ohaba A to Ohaba B climatic fluctuations, substantially increased toward the end of the latter. The development of forest in which the oak seems to be abundant enough points out to an improvement in weather conditions during the Gravettian stages that were stratigraphically and technico-typologically placed into evidence⁷⁰.

At Bistricioara-Lutărie, the beginning of the Gravettian habitation (palynologically located on the level of the Middle Gravettian at Țirțu), belongs to a period of warming of the weather, when thermophilic species grew in large numbers. Geochronologically, this period belongs based on palynologic grounds, to the Ohaba B climatic fluctuation⁷¹, prior to the last glacial Würmian stade.

On the Moldavian Plateau, the settlements palynologically investigated belong to northern (Suceava Plateau — Strachina-Dorohoi), central (south of Suceava Plateau-Topile-Valea Seacă), and southern (south of the Bîrlad Plateau) areas. Therefore, in the north of the Moldavian Plateau, at the Moldavian Plain border, during the end of Gravettian, there existed coniferous forests, with pine and spruce fir. The climate was not rigorous, because thermophilic trees could also resist (elm and hazel trees). Temperatures were not uniform during the whole sedimentation period because there was a limited period in which, along with a diminution of the pine and spruce fir trees, the grass and graminaceae developed, and thermophilic species (*Tilia*, *Quercus*) appeared in small numbers. Therefore, the Gravettian populations

⁶⁸ M. Cărciumaru, *op. cit.*, p. 119.

⁶⁹ *Ibidem*, pp. 123—125.

⁷⁰ *Ibidem*, pp. 156—157.

⁷¹ *Ibidem*, pp. 168—169.

/

that lived on the plateau near Dorohoi town, lived in the so-called tardiglacial pine stage⁷².

In the central area of the Moldavian Plateau (south Suceava Plateau), at Topile-Valca Seacă we find the following. During the period of transition from Upper Pleistocene to Holocene (the *Pinus-Betula-Salix* episode) together with *Pinus* and *Picea* grew *Tilia*, *Betula* and *Salix*, as well as various herbs. Among the latter were: *Gramineae*, *Compositae* and *Chenopodiaceae*⁷³.

In the southern area, the Gravettian settlements occurred during the last cultural episodes of the Gravettian Technocomplex, geochronologically during the Tardiglacial. The pine (*Pinus-Picea*) distinguishes this episode⁷⁴. In all the settlements that were palynologically investigated (Mălușteni I, II, III and Berești) there were found coniferae pollen, coniferae which occurred mixed with oak trees (*Tilia*, *Salix*, *Quercus*). A great prevalence of such steppe plants as *Gramineae*, *Compositae*, *Artemisia*, grew there at that time.

In conclusion, interdisciplinary research has shown that the East Gravettian populations found environment conditions that were extremely favourable for settlement. The surroundings provided by the climate, rivers, relief forms, flora and fauna of so various geographic areas were very rich, indeed. We must mention that certain elements (soil, flora, fauna) were only briefly treated here. They will be completed in the next chapter, where an exhaustive description of each of the over 35 systematically excavated Gravettian settlements will be presented.

⁷² *Ibidem*, pp. 203—205.

⁷³ *Ibidem*, pp. 205—207.

⁷⁴ *Ibidem*, pp. 207—215.

CHAPTER III

GRAVETTIAN SITES IN THE EAST OF THE CARPATHIANS

1. COTU MICULINȚI, COMMUNE OF COTUȘCA, DISTRICT OF BOTOȘANI

GÎRLA MARE

History of Research

This site was discovered and studied by M. Brudiu between 1977—1979. It is on a promontory with NW—SE surface inclination. At the confluence with the Prut River, on the left side of the valley that flows into this river the loess sedimentation houses several Gravettian habitation levels.

Geological Stratigraphy

- vegetal soil, 0.35—0.40 m thick ;
- brown soil, with croto vines at the base, 0.60—0.80 m thick ;
- transitional zone between the lower one (Late Pleistocene) and the upper (Holocene), with numerous croto vines, 0.20—0.25 m thick ;
- loess deposit with croto vines on the upper surface, 3.50—4 m thick ;
- at a depth of 5.00 m, calcareous stones were encountered.

Archeological Stratigraphy

I — Final Gravettian habitation was discovered at a depth of 1.70—1.80 m, with both cultural and faunal materials.

II — Habitation level was identified at a depth of 2.00—2.20 m and of 2.30—2.50 m (depending on the inclination of the slope) ; rich archeological and faunal remains.

III — Culture stratum, situated at a depth of 2.50—2.70 m and of 2.60—2.75 m, rich in workshop debris and lithic pieces.

IV — Habitation level, situated between 2.80—3.10 m, with workshop debris and faunal remains.

V — At a depth of 3.50 m, a culture stratum containing a hearth and three lithic workshops.

VI — In a glazed deposit with calcareous concretions, at a depth of 3.70 m, cultural level was identified, but poorer than in the upper ones due to the limited surface of excavations.

VII — Between 4.30—4.50 m, the first inhabitation level ; reduced cultural materials due to limited scope of excavations.

As we can notice, some of the inhabitation levels seem to be separated by sterile strata from the point of view of both archeology and fauna. They

are of variable thickness, due to the inclination of the whole geological profile. This has led to a lack in uniformity of archeological deposits. In fact, new data will be available in future by extending the present excavated surfaces.

Workshop Complexes

About 65 workshops for the production of silex tools have been discovered at Cotu Miculinți. They are characterized by a large number of silex objects in a reduced perimeter and the typical presence of grit stone slabs used as anvils. Level III has 35 such complexes, level II 20, level IV has 7, only level V has 3 workshops.

A specific feature of the site are the specialized workshops for processing reindeer bones and antlers, especially in levels II, III and IV.

Hearths are missing from the cultural strata I and VII. Some calcinated silex pieces occur in the first one. Level II has several hearths, 2—12 cm in depth, some containing silex pieces and calcinated bone elements which could supply carbon samples for radio-carbon analyses. In level III, it appears that reindeer antlers were used as fuel, similar to Musterian levels at Ripiceni-Izvor. In level IV a hearth was discovered, 2 m in diameter and cm, depp particularly rich in burnt waste and wood charcoal. On the basis of the presence of the partially superimposed hearths, levels V and VI were established, the same criterion being used in the Gravettian site at Lespezi (district of Bacău) to establish the archeological stratigraphy. The C-14 determinations which will be made on the basis of many samples collected from numerous hearths will contribute to establishing absolute chronologies, as exact as possible, for the levels II—VI of this important site.

The presence of the grit stones slabs in level V might represent the traces of a specially arranged dwelling place both for people and the protection of fire.

Palaeofauna

Settlement as a whole being characterized by the presence of the workshops for the processing of reindeer bones and antlers, the existence of rich remains of palaeofauna is by no means surprising. M. Brudiu specifies that only in levels I, V and VI the bone fragments were generally too corroded to allow identification. In the other levels, except the first stratum (VII) where only bovide remains were found, although the reindeer (*Rangifer tarandus*) prevails, there have also been identified osteological fragments belonging to the bovides, to the horse and even to the marmot (level III). The skull fragments seem to be missing (the same situation as at Buda-Dealul Viei), but many molars were identified, as well as omoplate fragments or fragments of the anterior and posterior limbs.

Lithic Assemblages

A characteristic feature of the settlements in the epigenetic areas of the Middle Prut is represented by the extraordinary richness and variety of lithic assemblages by which we mean not only the typology of finished tools but also the debitage products. In the sites of this microzone, especially at Cotu Miculinți, Crasnaleuca and Mitoc, the activity of silex production occupied a secondary place, after that of supplying food by hunting.

In the site at Gîrla Mare it was possible to identify quite a rich and varied series of tools :

Level I. Besides scrapers, a burin and a perçoir, that can be associated with Final Gravettian, it is surprising to discover scrapers on macrolithic flakes and planes on exhausted nucleii.

Level II. The following were identified within the perimeter of the 20 workshops :

- 37 scrapers of different types, the nucleiform ones included ;
- 101 burins belonging to all the known subtypes, most of them being those on truncation and angle break ones ;
- 2 burin-scrapers ;
- 8 perçoirs ;
- 10 scrapers ;
- 2 planes ;
- 4 truncated and retouched blades ;
- 90 blades ;
- 16 „crested“ blades. In this particularly rich level, IB = 62 % and IG = 23 %.

Level III, equally rich through its 35 workshops, contained 216 typical pieces :

- 71 scrapers, most of them convex ones, on blade end, some of them nucleiform ones ;
- 126 dihedral burins, on unretouched fragmentary blade, some of them double, on retouched truncation, etc. ;
- 9 perçoirs, some of them multiple ones ;
- 2 burin end scrapers ;
- 4 scrapers on flake or nucleiform ones ;
- 1 perçoir scraper ;
- 1 plane ;
- 4 blades with retouched truncations.

We can realize that in this level the number of end scrapers is double and, although the number of burins has increased, the first type of tools is prevailing by comparison with level II

Level IV. Because of the limitations of the excavated surface, the number of the finished pieces is very small by comparison with upper levels. In this level only the following were identified : 5 end scrapers on blade point and a nucleiform one, 4 burins, of which a dihedral one and another one on a retouched oblique truncation, a sidescraper and an oblique retouched truncated blade.

In the excavations of 1979, level V contained an atypical end scraper, a „La Gravette“ point and a nucleiform plane.

In level VI only one silex piece was found and in level VII a double burin on a retouched rectangular truncation and a perçoir.

The raw material is represented by silex in as almost 100 %. Only a few menilite pieces were discovered. As to the size of tools, they are medium-size pieces and microlithic ones. Few finished microlithic pieces are represented by nucleiform sidescrapers or those on flakes. We have not included in this analysis nucleii, unretouched flakes and blades, nor primary debitage products.

Bone Tools

Cotu Miculinți-Girla Mare is singular for the Gravettian period in Romania and in the Southeast and East of Europe, except for the sites in the Kostenki group on the Don.

In our opinion, the tools and weapons were made by several processes : carving through incisions made by means of burins, by removing or reducing of the antlers base and then with a sharp tool successive blows were given to diminish its resistance, facilitating the breaking of the antler in the desired place. The finishing of tools and weapons was achieved by carving, scraping and drilling with the help of perçoirs made of silex, from both sides of the piece to the inside. At Cotu Miculinți-Girla Mare it was possible to identify a rich typological inventory of both tools and weapons :

- points were obtained by thinning an antler or fragments of bones, through scraping ;
- perçoirs, improved tools obtained through carving and polishing ;
- spears were obtained by sharpening the reindeer antlers, after removing the nodules and the ramifications ;
- lances were obtained by splitting the antler, the inner grooves being made by removing the spongy part of the antler in order to form a channel to drain the blood of the hunted animal.

Other pieces of the same type had external grooves. Such pieces were identified — most of them in a fragmentary condition in levels II and III :

- the pick-hammer worked at the proximal end of an antler, after its having been lost by the animal. The base was used for hitting (the hammer), and the opposite part, severed with the help of a cutting flake, was longitudinally drilled by removing the spongy part. Here, a piece with a sharp end was introduced, the whole tool being probably used for digging up tubers, eatable roots, etc. It belongs to level II ;

- harpoons were obtained from a split reindeer antler. Initially, it had two pairs of small sharp wings (barbels) symmetrically disposed. At the moment of its discovery, only one small wing still existed, 12 cm long, 3 cm wide and 0.6 cm thick. It was identified in level III :

- a sceptre, made from a reindeer antler and having at its distal end several traces of transversally given blows and a perforation at its proximal end. This piece belongs to level II.

In levels II and III there were discovered other fragments of reindeer antler or bones — which suggest human intervention, but whose usage is not very clear — and also much waste material resulting from the carving of other bone or antler tools and weapons.

Other Discoveries

Ochre and fossilized resin balls (amber ?) were discovered in level II, while level III revealed a piece of petrified wood of unknown species whose sizes were 26 × 7 × 3.50 cm.

Conclusions

Seven habitation levels were stratigraphically identified on a profile of only 3.50—4.00 m but without any striking typological differences of tools. From the study of lithic tools at each level, especially those in levels II, III and IV, it may be realized that some pieces of Mousterian tradition hold a larger share than in the levels at Mitoc-Valea lui Stan. M. Brudiu does not mention the existence of blades of „a bord abattu” type, but only one „La Gravette” point. The identification of such a large number of burins and scraping pieces (sidescrapers, planes) can be appreciated as normal, taking into account that the populace here were specialized in processing the bone and mainly reindeer antlers. The microlithization of the lithic inventory specific to the Gravettian in its last stages is again not confirmed either in this site or at Mitoc. This could be due especially to the closeness to the natural quarry of raw material — the Buglovian silex from the nearby Prut. There was no urge, in our opinion, to spare material as with the settlements in the more distant areas such as those in the Suceava Plateau or in the south of the Moldavian Plateau.

Reindeer has certain implications worth considering from a geochronological point of views. If all the reindeer antlers used by the members of the Cotu Miculinți-Girila Mare community, had the bases intact, it follows that these were found and did not result from hunting of this animal specific to the cold climate. However, remains of dentition were also found which cannot be explained but from the hunting the animal. It follows that the site was in a periglacial position and that other cold weather herbivorous animals such as bovines and horses, resistant and adaptable, could have favourable conditions for existence. To this we should add the depositing period of loess sediments *directly* on the Sarmatian rock bed. If we admit that this phenomenon could happen in an interstadial period we are in favour of dating this settlement (levels I—IV) in a time of an increasingly cold oscillation — immediately anterior or posterior to the last glacial stade (Würm III) when the advancing of the ice cap also determined the presence of the specific fauna (the marmot, the reindeer). Levels V—VIII may be even older but at the present research stage, any attempt at being more exact may easily be erroneous due to the scarcity of elements that can be considered in this respect. The seven habitation levels stratigraphically established cannot represent just as many cultural — chronological stages since they may be due to the unitary character of lithic tools. The archeological sterile strata are about 5—10 cm in thickness. The bigger differences stratigraphically established can surely be explained by the special depositing conditions of the loess, as shown by Florea Mogoșanu in his latest study about the Middle Prut area.

References

- M. Brudiu, *Rezultatele cercetărilor arheologice din stațiunea paleolitică de la Cotu Miculinți, com. Coțușca (jud. Botoșani)*, in *Materiale și cercetări arheologice*, Oradea, 1979, pp. 7—16 ; M. Brudiu, *Prelucrarea oaselor și coarnelor de ren în așezarea paleolitică de la Cotu Miculinți (jud. Botoșani)*, in *SCI VA*, 31, 1980, 1, pp. 14—22 ; M. Brudiu, *Cercetări arheologice în stațiunea paleolitică de la Cotu Miculinți, jud. Botoșani*, in *Materiale și cercetări arheologice*, Tulcea, 1981, pp. 5—11 ; M. Brudiu, *Le travail de l'os et du bois de renne dans le Paléolithique supérieur de la zone du Prut Moyen. Répertoire typologique*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie* (éditeur V. Chirica), Iași, 1987, pp. 73—87 ; Fl. Mogoșanu, *Despre stratigrafia și periodizarea Gravettianului din Moldova*, in *SCI VA*, 37, 1986, 2, p. 160.

2. CRASNALEUCA, COMMUNE OF COȚUȘCA, DISTRICT OF BOTOȘANI STANIȘTE

History of Research

N.N. Moroșan had investigated most of the Middle Prut River by 1938. Starting in 1952, N. N. Zaharia continued this activity. The first Paleolithic discovery at Crasnaleuca-Staniște was accidental. In 1961 M. Bitiri published some Paleolithic materials found at Crasnaleuca hamlet, without specifying the place of discovery.

Beginning in 1974 large scale salvage work was done in the area of proposed Costești-Ștefănești hydroelectric facility on the Prut River initiated by „A. D. Xenopol” Institute of History and Archeology in Jassy. M. Brudiu began the systematic investigation of various geological features peculiar to the river within the present day environments of Crasnaleuca village. On the chuff of the Staniște Creek, M. Burdiu made several excavations, and found important archeological and faunistic materials.

Geological Stratigraphy

Four sections were opened in the cliff. The following sediments were identified :

- vegetal soil, 0.15 m thick ;
- unleached grey soil, 0.80 m thick ;
- grey-yellow Ca CO_3 soil ;
- transition soil, sometimes overlapping the fossil soil ;
- dark yellow soil ;
- loess Ca CO_3 deposit of variable thickness ;
- grayed reddish deposit at the base of loess ;
- tertiary deposit of clay, limestones and silexes are situated at the base of this formation.

As this site like Mitoc-Malul Galben and Piriul lui Istrati, lies in a loessic colluvium of the middle terrace, the loess deposits are of variable thickness, but much thicker than with a stable form of relief (the terrace).

Archeological Stratigraphy

In section I of the rivulet cliff, situated about 40 m south of a clay pit, a single archeological level was identified at a depth of 7—7.30 m. It was situated at the base of a loessic deposit. This level consisted of three lithic workshops.

In section II, situated about 15 m west of the first one, a single cultural stratum was identified, represented by a lithic workshop and two bone pieces. The archeological layer lies at the base of the same loessic deposit but at a depth of 8.60 m.

Section III was located 40 m upstream from the previous one, where the loessic deposit is thinner than downstream, towards the creek of the Prut River. Two cultural levels were found, the former situated at a depth of

4.40 m and the latter at 4.80 m. A 40 cm thick sterile lies between them. Both of them contain archeological and palaeofaunistic remains, as well as hearths.

The clay pit was excavated on an area of 60 sq. m. to 10.5 m. Deep eight habitation levels in the loess deposit were indentified :

- level I, situated at a depth of 1.90—2.10 m, comprised two workshops ;

- level II had a depth of 5.10 — 5.30 m, and was separated by an almost 3 m thick sterile stratum from level I ; some fragments of charcoal and a workshop were identified ;

- level III was at a depth of 5.90—6.10 m ;

- level IV was situated at a depth of 6.60—6.75 m. It provided the only C-14 dating of the site, on the basis of the sample of a rich hearth charcoal ;

- level V was situated at a depth of 7.00—7.15 m. A hearth was found within which there were some archeological materials ;

- level VI, situated at a depth of 7.40—7.55 m. was represented by several workshops and scattered faunistic remains ;

- level VII occurred at a depth of 8.40—8.60 m and supplied a rich lithic workshop and faunistic remains, among which was a bovine jaw ;

- level VIII, situated at a depth of 8.80—8.85 m, was located at the lower part of the loessic deposit. It contained remains of hearths destroyed by erosion, a workshop, faunistic remains and several slabs of grit stone. At a depth of 11 m were found only sterile deposits at the profile base.

Workshop Complexes

In the habitation levels various concentrations of silex pieces were identified and gritstone slabs, considered to have been used as anvils. They are characteristics of lithic workshops. Large workshops were found in levels IV and VIII, rich in debitage. Level VI also has workshop. Workshops were also discovered in section I and II. One of them in section I contained a large quantity of bone debris and reindeer molar teeth. Another one had a grit stone slab used as an anvil.

Some hearths occur *in situ* position but others have largely been eroded, leaving a charcoal scatter. From this point of view, one can see the effect of such processes on the last two habitation levels (I, II), which is specific to the sheltered zones, where the loess was always deposited by the wind.

A hearth in level IV produced an important date of $19,460 \pm 220$ years B. P. (Bln — 1443). Still other samples were subsequently gathered from the hearths in levels V—VI. The latter should supply in time new chronostratigraphic data as to when the site may have been inhabited.

Hearths in section III (level II, situated at a depth of 4.80 m) were very rich but the charcoal appears to have been affected by erosional processes.

As for other arrangements, we consider it not to be impossible for the grit stone slabs to belong to some shelters specially fitted up, of seasonal habitation type, also identified in other cultural levels of the habitations in the zone of the Middle Prut River or on the terraces of the Bistrița River.

Palaeofauna

Numerous palaeofaunal remains were discovered both in the clay pit and in sections I—III. Some of them were very important as a former food supply.

Several but not all the bones found, were very poorly preserved. As a consequence, they cannot be utilized as climatic markers. Preservation has been greatly affected by soil alkalinity.

Within the eight stratigraphic levels, some better preserved palaeofaunal remains were encountered: bovines (level VII) and horses (level VIII). In the other three sections, the incidence of reindeer molar teeth (workshop I and II in section I) is extremely important.

In the clay pit loess, the presence of the following malacological species were identified: *Succinea oblonga*, *Pupila muscorum*, and *Helicopsis striata*. They seem to point to a dry steppe climate.

Lithic Assemblages

Numerous and various types of tools were found in sections I—III in the clay pit. They occurred both within and outside of workshop areas.

The most numerous tool type were end scrapers, whose diversity is remarkable: convex on blade end ones, high (carinated) ones, nucleiform ones, followed by sidescrapers on flakes or nucleiform ones. Perçoirs are scanty and there is a double piece on a middle flake. Burins are few and are generally made on retouched truncations, but some angle on break ones occur, too. One curved dihedral burin was found. Abruptly retouched pieces are weakly represented and are only partly retouched. There are to be noted, however two Gravette points, one of them of melinite, the other of silex. Flakes and an end scraper on blade, as well as two middle blades with one or both sides retouched abruptly were discovered.

Bone Tools

A spear point and a sceptre were discovered in section II in the cliff of Staniște Rivulet. The 15 cm spear point was carved in a long bone, its two longitudinal symmetrical grooves being achieved through polishing. The sceptre was worked of an *Equus caballus* L. metatarsus, bored near the articulation of the distal extremity. Both pieces present an advanced degree of fossilization, and the vertical position of the sceptre may give the impression of rolling-transport and redeposit.

Other Discoveries

In a silex rich zone there also occur some atypical pieces and even some finished melinite tools. They raise the question of trade relations with groups from other geographical zones.

The presence of some ochre and fossilized resin balls is noted in section III.

Auxilliary Station

The Staniște terrace the place where another site was explored. It was located on the middle terrace of the Prut River to the southeast of the previous sections.

Geological Stratigraphy

- unleached vegetal soil 30–40 cm thick ;
- grey soil 40–45 cm thick with some pieces with a Paleolithic aspect ; post-Paleolithic cultural remains are also involved (Eneolithic, the Geta – Dacian epoch) ;
- transitional light-yellowish soil with numerous crotonovines, 40–50 cm thick ;
- dark yellow soil 20 cm thick ;
- loess deposit, 1.90–2.00 cm thick with Upper Paleolithic remains. in the upper part ;
- sand deposit at the base of the terrace.

Archeological Stratigraphy

Materials were identified in the lower part of the transitional and in the upper part of the loess levels. Workshops were represented.

Lithic Assemblages

From a typological point of view the following can be said of finished pieces :

— end scraper on blade	3	3.7%
— double end scraper	1	1.2%
— carinated end scraper	2	2.5%
— atypical carinated end scraper	1	1.2%
— nucleiform end scraper	15	18.3%
— end scraper-burin	5	6 %
— middle dihedral burin	8	10.8%
— curved burin	2	2.5%
— angle burin	4	4.9%
— burin on oblique retouched truncation	4	4.9%
— splintered piece	1	1.2%
— perçoirs	4	4.9%
— Gravette point	1	1.2%
— „a bord abattu“ bladelets	8	9.7%
— abruptly retouched blades	5	6 %
— obliquely truncated and retouched blade	1	1.2%
— crested blade	5	6 %

Also found were nuclei (7), decortication flakes (20) or nucleiform ones. (7), unretouched blades (87) and retouched blades (20).

Conclusions

The discoveries at Crasnaleuca are the northernmost in the area under discussion. On the Staniște cliff rivulet, the four sections are estimated to have an extent of about 100 m in length. It is possible the cliff may have been used by several Gravettian groups for setting of their seasonal settlements. Stable dwellings are missing.

A certain connection between cultural levels in all sections would be necessary for a full understanding of the dynamics of settlement patterns. As for the archeological stratigraphy of the clay pit, we think that the eight stratigraphical levels may not represent real cultural levels. Moreover, it is not impossible that by widening the excavated area some of them might fuse into each other by discovering other intermediate habitation complexes (what had been considered as sterile strata from archeological and faunistic points of view).

The absolute age of level IV is of paramount importance. The geochronological framework of both this section and level and of some habitation levels at Cotu Miculinți can be ascertained.

Taking into account this age determination of $19,160 \pm 220$ B.P. (range of 19,680—19,240 years) we can reach the following conclusions. This particular habitation level with its three workshops, the reindeer molars in sections I and II, as well as the first habitation levels (VIII—V) at the clay pit may belong to a period immediately before the last glacial stage. After this climatic oscillation, local populations may have retired either to well sheltered zones or to southern parts of the continent. The Staniște sites were later inhabited again but the big herbivorous animals were no longer present in levels IV—I at Lutărie (clay pit) due to the change in climate conditions. These changes are also reflected, as a matter of fact, in the alterations that took place in the structure and chemical composition of loess which became more acid, determining the destruction of faunistic remains.

A similar situation to the one of Cotu Miculinți is the rather archaic character of lithic assemblages, through a certain preponderance of older pieces that, in a normal archeological and geological stratigraphy, ought to be attributed to an early period of Aurignacian. The incidence of these types of tools in the Gravettian at Crasnaleuca and Cotu Miculinți might have been conditioned by momentary economic necessities of human communities, regardless of a strict typology, specific to the cultural stage they are framed in.

References

M. Bitiri, *Noi descoperiri paleolitice in nordul Moldovei*, in *SCIIV*, 12, 1961, 2, pp. 335—336 ; Al. Păunescu, P. Sadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, București, 1976, vol. I, pp. 85—86 ; M. Brudiu, *Date noi privind cultura Gravettianului oriental din Moldova, rezultate din cercelările de la Crasnaleuca*, jud. Botoșani, in *Hierasus*, Anuar '78, I, 1979, pp. 77—81 ; M. Brudiu, *Descoperiri paleolitice la Crasnaleuca*, com. Coțușca, jud. Botoșani, in *SCIIV-A*, 31, 1980, 3, pp. 125—113 ; M. Brudiu, *Le travail de l'os et du bois de renne dans le Paléolithique supérieur de la zone du Prut Moyen. Répertoire typologique*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie* (édit. V. Chirica), Iași, 1987, pp. 73—85.

3. GHIRENI, COMMUNE OF COȚUȘCA, DISTRICT OF BOTOȘANI BALTA LATĂ

History of Research

N. N. Zaharia, by repeated surveys of the terrace on the right bank of the Ghireni river, discovered sporadic silex pieces belonging to an uncertain cultural epoch.

These researches were taken up in 1970 by Al. Păunescu and V. Chirica and encavations were made.

A culture stratum, rather superficial, was found immediately under the vegetal soil, some 10—15 cm thick. Besides surface pieces, others were discovered in the transition level from the chernozem to the yellow loessic soil. The following were found :

— 5 end scrapers, of which 3 convex ones, 2 unguiform and a subcircular one ;

— 1 mixed multiple burin ;

— 1 „à bord abattu” blade ;

— 1 perçoir ;

— 3 denticulate blades ;

— 1 finely retouched blade together with unretouched blades, nuclei and atypical flakes.

No dwelling complexes, hearths or lithic workshops were discovered in the limited area excavated. There were no remains.

Conclusions

The singular culture stratum, in its uncertain stratigraphic position, the scarcity of lithic tools allow us attribute this settlement to an indefinite stage of the Gravettian Technocomplex.

References

Al. Păunescu, *Cercetări paleolitice în județul Botoșani (1970)*, in *Materiale*, X, 1973, pp. 9—10 ; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, București, 1976, p. 87.

4. MITOC, COMMUNE OF MITOC. DISTRICT OF BOTOȘANI VALEA LUI STAN

History of Research

In 1974, V. Chirica discovered a fourteenth Paleolithic site at Mitoc commune and in 1977 systematic excavations were begun with the participation of C.M. Istrate.

Geological Stratigraphy

The middle terrace of the Prut River presents a strongly inclined slope to the southwest due to much and intense erosion. In order to establish the geological succession of strata, six sections were dug — three on the forefront of the terrace and three on its higher bridge.

In the bridge section, the following stratigraphic succession was established :

— 0.00—0.30 m, black vegetal soil ;

— 0.30—0.70 m, dark reddish — brown soil ;

— 0.70—1.10 m, reddish — brown soil ;

At both Piriul lui Istrati and Mitoc-Malul Galben, these soils are situated at the upper limit of the Paleolithic sites. At Valea lui Stan this deposit contained most of the archeological materials.

- 1.10–1.60 m, reddish – yellow soil with sporadic silex pieces ;
- 1.60–2.00 m, yellow soil, sterile from archeological and faunal points of view.

The forefront of the terrace, very much affected by intense erosion, presents a somehow different stratigraphy :

- 0.00–0.20 m, reddish – brown soil ;
- 0.20–0.50 m, light yellow soil ;
- 0.50–0.80 m, dark yellow soil ;
- 0.80–0.95 m, light yellow soil ;
- 0.95–1.20 m, slightly sandy yellow soil ;
- 1.20–1.40 m, reddish – yellow soil ;
- 1.40–1.60 m, light yellow soil with sandy lens.

Lithic materials were identified in all the geological levels and also on the surface.

Inhabitation surfaces and even workshops are missing. A natural quarry of Buglovian silex was found on the northeastern slope of the terrace, near the Prut River bank. Some of the silex pieces are calcined. Hearths were completely destroyed through combined processes of erosion and transport.

Faunal remains were not discovered except for few gasteropoda shells.

Lithic Assemblages

The whole area of the site – in its six sections – produced 1,504 pieces. They included nuclei (some of them also used as perçoirs), 63 unretouched flakes, 148 unretouched lamellar flakes, 1,109 blades (381 micro-lithic ones, 692 medium-size ones, 5 macrolithic ones, 31 of the „crested” type) and 142 typical tools :

- 74 end scrapers : 6 carinated, 2 atypical carinated, 50 convex, 4 fan-like, 2 unguiform, 1 ogival, 1 nosed, 1 double, 3 on retouched blade, 3 with oblique active end and 1 atypical ones (52.11 %) ;

- 11 burins : 2 double angle on retouched concave truncation ones, 4 dihedral, 2 angle on retouched oblique truncation, 2 atypical ones (7.94 %) ;

- 2 burin-end scrapers (1.33 %) ;

- 23 retouched blades (16.20 %) ;

- 7 denticulate blades (4.93 %) ;

- 17 pieces with retouched encoches (12.60 %) ;

- 1 obliquely truncated and retouched blade (0.70 %) ;

- 4 nucleiform planes (2.81 %) ;

- 1 backed knife, atypical (0.70 %) ;

- 3 perçoirs (2.12 %).

Conclusions

Due to the absence of specific archeological features (habitation surfaces, hearths, palaeofaunal remains, etc.) probably destroyed by erosion, the characteristic features of this site can be determined only by the nature of lithic tools. The unity of all the lithic material from the surface, the reddish-brown

soil of the terrace bridge and the loessic deposit suggest that only one disturbed inhabitation level is present. There may have been more, but they have been destroyed by erosion.

The cultural and geochronological dating of this lithic inventory is problematical.

The lack of so-called directing fossiles specific to the Gravettian Technocomplex makes it somehow difficult to assign the discovered lithic materials to this period. The presence of some carinated end scrapers and nucleiform planes, although small in number, could represent cultural elements specific to a kind of Aurignacian. The general aspect of the whole body of the material, the existence of numerous long and slender blades, burins on retouched oblique truncation, perçoirs, leads us to believe that the features of the Gravettian which have been encountered belong to its initial stages of development. In this context, we are of the opinion that the discoveries at Valea lui Stan could well be contemporary with the first Gravettian level at Mitoc-Malul Galben. We include the latter in the climatic oscillation of Kesselt 2 — Stillfried B, here paralleled with Ohaba B.

References

C. M. Istrate, *Locuirile paleolitice și epipaleolitice de la Mitoc—Valea lui Stan*, in *Hierasus*, Anuar '78, I, 1979, pp. 83—96 ; C. M. Istrate, *Așezarea paleolitică de la Mitoc—Valea lui Stan* in *Mem. Ant.*, VI—VIII (1971—1976), 1981, pp. 7—11 ; V. Chirica, *Așezările paleolitice de la Mitoc* (mss.).

5. MITOC, COMMUNE OF MITOC, DISTRICT OF BOTOȘANI MALUL GALBEN

History of Research

In 1885, geologist Gregoriu Ștefănescu discovered at Mitoc the first Paleolithic settlement in Romania. A few years later, another geologist, Ioan Simionescu, was to confirm his predecessor's discovery. In the third decade of our century, geologist and archeologist N. N. Moroșan undertook a large scale survey and various sondages in the Middle Prut Valley. More than 30 Paleolithic sites were located on terraces of both the Prut and Dniester rivers and their affluents.

Between 1956—1957, C.S. Nicolăescu-Plopșor took stratigraphic soundings at Mitoc-Malul Galben. Since 1978, V. Chirica has initiated systematic excavations in this site. It is probably the largest and most deeply stratified Paleolithic station in the southeast of Europe.

Geological Stratigraphy

Studies indicate that the site is situated on an alluvial formation of a Prut terrace at its confluence with Ghireni Creek. The thickness of the deposits there is about 15 to 16 m. It cannot be compared to the 9 — 10 m present terrace. The entire sedimentary deposit lies in a graben dug in Buglovian limestone (toltry) which flanks it on both sides. Over this

toltry member there are a 1 m stratum of sands and gravels with silex nodules and a 1.5 m one of reddish and black-brown sand. A 13–14 m thick stratum with sandy and clay sediments (slightly loessic) lies directly above. The basal sand suggests the alluvial origin of the deposit. On the basis of geological stratigraphy, it was found that, due to the almost continuous deposition, fossil soils are missing. Some of the interruptions in the sedimentation rate may be explained by the human settlements activities.

N.N. Moroşan noticed the following stratigraphy at Malul Galben :

- 0.30–0.85 m, black vegetal soil ;
- 5.20 m, typical, clear yellow loess ;
- 0.10 m, fossil stratum belonging to the Upper Palaeolithic ;
- 1 m, loess with an analogous structure to the upper one ;
- 1.20 m, sandy loess gradually passing into sandy clay ;
- 2–3 m, slightly clayey sand ;
- basal gravels of the terrace.

After the 1956–1957 investigations, the following stratigraphy was established :

- gravel and sand deposited on bedrock made up of calcareous rocks and silex boulders ;
- blanket of buried fossil soils of a dark colour ;
- bluish clay inundation deposits which include some lenses of reddish-yellow fossil soils ;
- loess deposits, uniform in colour and granulation ; intercalated by strata deposited by inundation (alluvial sediments), loess dark in colour with calcareous impregnations of a pseudo-micelian aspect ;
- alternating sand and clay laminations ;
- vegetal soil rather consistent as regarding thickness.

Both of the above authors consider that the terrace was formed in the Mindel-Riss Interglacial. The accumulation of gravel and sands took place during Glacial period. The bands of clay and fossil soils belong to the Riss-Würm Interglacial. The upper sedimentary deposits — the human settlements included — are to be attributed to the last glaciation.

From an archeological point of view, lithic pieces typologically belonging to the end of the Lower Paleolithic have been found at a depth of 12 – 13 m (Clactonian or Levallois techniques). These were followed stratigraphically by Mousterian habitation surfaces with relatively poor lithic and faunal material. Uppermost were Aurignacian habitation levels with rich lithic inventories.

The following stratigraphic succession can be established on the basis of our own long-term excavations .

- 0.00–0.70 m, dark brown vegetal soil (the A horizon of the chernozem) ;
- 0.70–1.44 m, brown soil, lighter and lighter to the lower part which revealed sporadic redeposited rolled silex pieces, most of them, atypical ;
- 1.44–1.90 m, reddish – yellow soil of a darker shade with CaCO_3 nodules ;
- 1.90–2.30 m, laminated yellow slightly sandy soil with few redeposited lithic materials (rolled) from a Mousterian occupation situated to the west at about 200 m ;

- 2.30–3.60 m, sandy yellow soil with horizontal and vertical bands and iron oxide (stained lenses);
- 3.60–4.50 m, laminated yellowish soils with sand lenses (alluvial origin);
- 4.50–8.00 m, loess deposit with slight CaCO_3 staining and some calcareous concretions.

Under this massive deposit there are other sediments containing Aurignacian and Mousterian habitation levels. They will be investigated later.

Another aspect of the stratigraphy of the site is represented by the inclination of the geological strata, both north-south and west-east; the latter is more pronounced.

Archeological Stratigraphy

We consider it necessary to specify that due to the still limited character of excavations, it is not yet possible to express final opinions about Gravettian archeological levels and their lithic assemblages. A few years ago we tentatively accounted for seven Gravettian levels at Malul Galben. At present we find as more plausible the existence of only four culture levels. Their geochronological position is still difficult to precisely establish without some chemical and palynological analyses. The C-14 analyses cannot yet be totally taken into account both because of the geological stratigraphy and because of some dating anomalies and changes in interpretation made by K. Honea. According to the latter, they are based on information released by the Groningen laboratory (W. G. Mook). So, the dating of $> 33,000$ B.P. (GX-8723) was presented, by using the 2 sigma deviation, as being in fact of $\geq 27,500$; the dating of $> 28,700$ (GX-8 725) was re-calculated (using the same 2 sigma deviation) at $\geq 23,100$ B.P.; the dating of $> 24,000$ B.P. (GrN-13 007) was re-calculated, using 1 sigma, at $30,000^{+6,500}_{-4,500}$.

Coming back to the archeological stratigraphy at the site, we offer the following hypothetical position of the Gravettian sequences:

- level I, situated at a depth of 7.10 m (in J–L, 10 squares) and of 8.10 m (in J–L, 0 squares), belongs to the first stage of Gravettian inhabitation. There are three sure datings for this level: $28,910 \pm 480$ B.P. (GrN-12 636), $27,500 \pm 600$ B.P. (OxA-1 778), $27,150 \pm 750$ B.P. (GrN-12 635), and other three doubtful ones: $\geq 27,500$ B.P. (GX-8 723), $27,410 \pm 430$ (GrN-14 914) and $27,100 \pm 1,500$ B.P. (GrN-15 453);

- level II is situated between 6.40 m (in J–L 10 squares) and 7.10 m (in J–L, 0 squares). It contains numerous lithic workshops. Six sure and four doubtful datings place this level between $25,140 \pm 210$ (GrN-14 036) and $26,910 \pm 450$ (GrN-14 037);

- level III could represent a middle stage of the Gravettian culture in Romania dated between $23,490 \pm 280$ (GrN-15 805) and $24,820 \pm 850$ (GX-9 425). It is situated between 5.60 m (in J–L, 10 squares) and 6.50 m (in J–L, 0 squares). It may be considered as contemporary with the middle Aurignacian stage at Bistricioara-Lutărie established by Al. Păunescu. There are six (repeated) sure datings and five doubtful ones for level III at Mitoc;

- level IV is situated between 4.00 m (in M, 10 square) and 5.25 m (in M, 0 square). There are three sure datings and four doubtful ones for this level. It is dated between $19,910 \pm 990$ (GX-8724) and $20,945 \pm 850$ (GX-8 503).

All the inhabitation surfaces contain a number of hearths and some quite genuine dwelling structures. There are also some dates for the Gravettian sequence whose stratigraphic positions don't seem to agree to occupation levels. This apparent discrepancy could be explained by the inclination of geological strata on both directions, as well as by the completely non-uniform sedimentation specific to a colluvium glacis.

Habitation Complexes

We don't aim at giving an inventory of hearths — more than 30 — and of the about 50 silex workshops. We shall only mention that some of the workshops, such as 7—8—12, 51, 56, 37, 21, 22, 49 occupy rather large surfaces, between 14 and 48 square metres. They have produced between 12,000 to 30,000 silex pieces, mostly debitage products (nuclei, flakes and unretouched blades).

Some hearths — very few — are represented only by mere burnt spots. Most of them, however, are well preserved and have supplied enough charcoal for C-14 determinations. Four categories of hearths have been distinguished: simple surface ones, surface with protected limestone grit slabs, deepened (alveolated) simple and alveolated ones, lined with gritstone or limestone slabs. It seems that workshops also included hearths at their outer edges so that the existence of some simple shelters seems assured. Such structures used large grit limestone slabs and were identified in complexes 15 (—6.10 m), 17 (—6.75 m), 51 (—5.75 m), etc. A quite unique one is the structure in complex 51. It contained a small workshop and several hearths. Large grit and limestone slabs outlined the dwelling. A mammoth tusk and some other objects were also identified around it, probably resulting from the construction elements that formed the framework of the shelter.

The presence of the mammoth tusk is hard to interpret at Malul Galben. This species was hunted by earlier Mousterians at Ripiceni-Izvor and may have changed its habitat during the Würm₂₋₃ interstade. In Aurignacian and Gravettian settlement areas in Romania, only sporadic mammoth remains have been found. This is not to support the conclusion that this species was a hunted game. The presence of mammoth bones could be explained by the need of building dwellings, the tusk being preferably used by all Paleolithic human communities. In this respect, we consider that the tusk at Malul Galben comes from an older Mousterian settlement, as such sites have been discovered in several points on the Prut terraces in the Mitoc commune area.

Palaeofauna

In all the inhabitation levels at Malul Galben, palaeofauna remains are rather abundant. The following species have been identified: *Felis leo spaelea*, *Ursus* (?), *Cervus elaphus*, *Rangifer tarandus*, *Bos primigenius*, *Bison priscus*, *Equus transilvanicus* Teodoreanu, *Equus* sp., *Equus* (*Asynus*) *hydrunticus*, *Rhinoceros tichorhinus*. Unfortunately, published sources do not specify the stratigraphic co-ordinates of each species, nor the number of individuals discovered at either Malul Galben or Piriul lui Istrati.

The malacologic fauna was studied more thoroughly, suggesting the existence of several palaeontological levels with specific climatic variants:

— at a depth of 3.90 m, an association of snails comprising *Punctum pygmeum* Drap., *Vallonia costata* Müll., *Cochlicopa lubrica* Müll, was encountered. *Abida secale* and *Clausidia parvula* are missing which points to a cold and dry climate, probably the tardiglacial type;

— at 4.50 m, to this can be added: *Helicella striata* Müll., *Hellicela unifasciata* Poiret and *Succinea oblonga* Drap. They seem to indicate the same cold and dry climate. In our opinion, these two levels (3.90–4.50 m) may be included in an alluvial laminated sandy deposit;

— at 6.50 m gasteropoda are dominated by *Helicella striata* Müll. with a few samples of *Vallonia costata* Müll, and *Pupilla muscorum* L. They indicate a temperate and dry climate, probably representing an inter-stadial one;

— at — 7.10 m snails are dominated by *Helicella*: *striata*, *unifasciata*, *itala* and *Pupilla*: *muscorum*, *submuscorum*, *loessica*, *sterri*, *bigranata*, *alpicola*. They pertain to an interstadial temperate and dry climate.

Other malacological populations were identified below 7.10 m, at 10 to 13.40 m. They correspond to Aurignacian and Mousterian occupation levels.

Lithic Assemblages

As we have earlier stated, stone working technologies at the site have resulted in a large number — over 50,000 — of waste anddebitage. In all the inhabitation levels large scale silex workshops certainly indicate proofs of the scope of exploitation. To this, the great number of pieces identified in each stratum, that is outside the workshops perimeter, is to be added.

The finished tools are very small in number, probably because we find them in higher proportions on the Bistrița River terraces in the Ceahlău area.

Level I — 7.10–7.40–7.85–8.10 m.

- 9 end scrapers: 7 convex, 1 straight, 1 atypical;
- 1 angle on a break burin;
- 5 retouched blades;
- 4 rabots and 1 double straight-convex sidescraper;
- 1 piece with „encoche“;
- 1 „à bord abattu“ bladelet.

Level II — 6.40–7.10 m:

- 37 end scrapers: 31 convex, 1 concave (made of gritstone), 4 carinated, 1 ogival;
- 5 burins: 3 angle, 1 nucleiform, 1 atypical;
- 4 rabots and 5 sidescrapers;
- 12 retouched blades;
- 1 blade with „encoche“;
- 2 retouched points, one of which made of gritstone;
- 16 „à bord abattu“ bladelets;
- 1 Dufour bladelet made of very fine gritstone.

Level III — 5.60–6.50 m:

- 3 convex and 1 ogival end scrapers;
- 1 dihedral burin;
- 2 end scraper-burins;
- 2 retouched blades;

- 1 atypical rabot ;
- 1 piece with „encoche“ ;
- 6 „à bord abattu“ bladelets.

Level IV — 1.00--5.25 m :

- 16 end scrapers : 13 convex, 2 carinated, 1 double ;
- 22 burins : 8 angle on a break, 13 dihedral, 1 nucleiform ;
- 7 retouched blades ;
- 2 denticulate blades ;
- 2 blades with „encoche“ ;
- 1 perçoir on flake with retouched double encoche ;
- 10 „à bord abattu“ bladelets ;
- 2 Gravette points ;
- 2 atypical bifacials.

Level situated over the sand lens :

- 9 end scrapers : 7 convex, 1 dihedral, 1 carinated ;
- 4 burins : 1 atypical, 1 dihedral, 1 angle on a break ;
- 2 end scraper-burins ;
- 1 straight sidescraper ;
- 1 blade with „encoche“ ;
- 8 retouched blades.

There are an insufficient quantity of finished tools at Malul Galben. Because of this, an opinion about certain correlations with other sites or their levels must be held in abeyance. Future extension of excavations, as well as re-evaluations of all the lithic assemblages by the end of our investigations, interdisciplinary studies and results of C-14 analyses will enable us, we hope, to better appreciate the character and place occupied by the Gravettian site at Mitoc in the context of the geochronological scheme of the Romanian Paleolithic and the Southeastern European one in general.

Bone Tools

After studying much of the bone material, we found that some pieces could be used as pickaxe-hammers, „piolets“, perçoirs, and others as „chisels“ in the production of silex or to dig up roots, bulbs, etc.

Other Discoveries

In this category of archeological materials, red-yellow ochre concretions were identified at a depth of 6.75 m, in the vicinity of complex 17. Of equal interest is the hearth discovered at a level of 7.40 m lined with no less than 24 calcareous stones. However, the most important discovery is a pendant amulet in complex 27, at 7.10 m, composed of a workshop and two hearths. The wood charcoal from one hearth was dated to $26,700 \pm 1,040$ B.P. (GX — 9418). The piece is carved in the natural cortex surface of a silex flake. It is decorated with incised lines on all lateral edges and all over its two faces. It has an oval form, a slightly concave base, and the size is $3.4 \times 3.4 \times 0.8$ cm. A perforation in the upper end — for suspension — was worked biconically, probably using a silex perçoir.

The soil conditions and the way the pendant was executed directly influenced the aspect of this object of art with religious and magical attribu-

tes : so, the upper face (abverse), situated from the beginning toward the core of the silex, is harder and better preserved, while the lower face (reverse), having been in permanent contact with the chemical agents in the soil, is slightly damaged, the ornaments included.

The amulet has seven lateral incisions on each side of the perforation and nine at the concave base. On each of the two faces the decoration is represented by a clubs — like element, spaces in between being covered with straight lines, in odd number, as well. The upper face central image may suggest a highly stylized caprine head. On the lower one a design, rather more complicated regarding both its execution and interpretation. Thus, in normal position (with the suspension hole upwards) the central image could suggest the horns of a bovine, while in reverse position (upside down) it could suggest a running human silhouette. In other portions the central ornament on both faces could represent an image of a dwelling, the shelter where „domestic“ activities took place. The incised lines which cover the empty spaces could also have another significance, but for lack of analogies it is difficult to express other interpretations. In similar cases, at both Asurkogo (southeast of the Baikal Lake) and at Pavlov II, the decorating lines are executed without any preestablished order but just to cover empty space.

The amulet at Mitoc-Malul Galben represents the first sample of genuine Palaeolithic art in the Romanian Gravettian. Its execution, not only with artistic intents could also be connected with hunting magic. It may represent the superior stage of the knowledge in the field first reached by the Gravettian communities that once populated the Prut area.

Conclusions

Researches carried out at Mitoc-Malul Galben thus far offered many important results regarding the Gravettian in Romania, the southeast and east of Europe. In some fields, results are still unsatisfactory. We refer to the reduced proportion of typical tools. They could represent sure points of reference for correlations of habitation levels in Upper Paleolithic sites in the East-Carpathian space of Romania. They could also point to analogies between these sites and settlements in the southeast and central part of Europe. But the lack of uniformity of archeological and geological (for the moment) stratigraphy generates difficulties in defining the cultural — chronological relationships.

From the point of view of absolute chronology we should consider, in a *senso strictu* line of reasoning (without analysing them in correlation with the co-ordinates of the excavation squares), the four levels of Gravettian occupation that may be defined :

I	28,910 ± 480	B.P. = 29,390 — 28,430 (Grn-12636)
	27,500 ± 600	B.P. = 28,100 — 26,900 (OxA-1778)
	27,410 ± 430	B.P. = 27,840 — 26,980 (GrN-14914*)
	27,150 ± 750	B.P. = 27,900 — 26,400 (GrN-12635)
	27,100 ± 1,500	B.P. = 28,600 — 25,600 (GrN-15453*)
	≥ 27,500 B.P.	(GX-8723*)

II	26,910 ± 450	B.P. = 27,630–26,460 (GrN-14037*)
	26,750 ± 600	B.P. = 27,350–26,150 (GrN-14035)
	26,700 ± 1,040	B.P. = 27,740–25,660 (GX-9418)
	26,530 ± 400	B.P. = 26,930–26,130 (GrN-15451*)
	26,100 ± 800	B.P. = 26,900–25,300 (GrN-15449)
	25,930 ± 450	B.P. = 26,350–25,480 (GrN-15456*)
	25,840 ± 90	B.P. = 25,930–25,750 (GrN-15808)
	25,610 ± 220	B.P. = 25,830–23,390 (GrN-15450)
	25,330 ± 420	B.P. = 25,750–24,910 (GrN-14913*)
	25,140 ± 210	B.P. = 25,350–24,930 (GrN-14036)
III	22,050 ± 1,250	B.P. = 23,300–20,800 (GX-9420*)
	≥ 23,000 B.P.	(GrN-15448*)
	23,070 ± 180	B.P. = 23,250–22,890 (GrN-13006*)
	≥ 23,100 B.P.	(GX-8725*)
	23,490 ± 280	B.P. = 23,770–23,210 (GrN-15805)
	23,650 ± 400	B.P. = 24,050–23,250 (OxA-1779)
	23,850 ± 330	B.P. = 24,160–23,500 (GrN-14034)
	24,400 $\begin{smallmatrix} +2,200 \\ -1,700 \end{smallmatrix}$	B.P. = 26,600–22,700 (GrN-15457*)
	24,620 ± 810	B.P. = 25,430–23,810 (GX-9422)
	24,650 ± 450	B.P. = 25,100–24,300 (OxA-1780)
	24,820 ± 850	B.P. = 25,670–23,970 (GX-9425)
IV	19,910 ± 990	B.P. = 20,900–18,920 (GX-8724*)
	≥ 23,000 B.P.	(GrN-15448*)
	19,900 $\begin{smallmatrix} +1,050 \\ -0,50 \end{smallmatrix}$	B.P. = 20,950–18,950 (GX-9429*)
	20,150 ± 210	B.P. = 20,360–19,940 (GrN-13765)
	20,300 ± 700	B.P. = 21,000–19,600 (GrN-14031)
	20,945 ± 850	B.P. = 21,795–20,095 (GX-8503)
	≥ 21,000	(GX-9424*)

From the same point of view of absolute chronology and also taking into account the Aurignacian dating of level of 7.85 m (28,910 ± 480 B.P., GrN-12636) we could identify at Mitoc the first level of Gravettian occupation belonging to the climatic oscillation Ohaba B-Kesselt-Stillfried B which also continues to the end of this oscillation and to the beginning of a new period of climatic deterioration. The second level of inhabitation could be dated as belonging to the climatic oscillation Herculane I — Tursac. The third level would be correlated with the climatic oscillation Herculane II — Laugerie. The fourth level could be paralleled with the final part of these climatic oscillations and completely with those that follow-Românești-Lascaux at the end of Pleistocene and the beginning of Tardiglacial. But we are to discuss this problem again in the chapter on the geochronology of Gravettian sites.

References

Gregoriu Ștefănescu, *Relațiune sumară de lucrările Biroului Geologic, în campania anului 1885*, in *Anuarul Biroului Geologic*, III (1885), București, 1888, p. 20; Ioan Simionescu, *Constituțiunea geologică a țărmului Prutului din nordul Moldovei*, in *Ac. Rom. Publicațiunile fondului „V. Adamachi”*, II (1901–1906), București, 1906, p. 41; N. N. Moroșan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est*, in *Anuarul Institutului Geologic al României*, XIX, 1938, pp. 59–60; V. Băcăuanu, *Observații geomorfologice asupra văii Prutului dintre Rădăuși*

și *Stîncea*—*Ștefănești*, in *AȘU — Iași*, Serie nouă, secț. II (Științe naturale), VII, 1961, 2, pp. 432 sq ; V. Băcăuanu, *Cîmpia Moldovei. Studiu geomorfologic*, București, 1968, *passim* ; V. Năstase, *Valea Prutului*, in *Revista de geografie*, II, 1956, 1—4, pp. 53—57 ; N. Barbu, *Interpretarea paleogeografică a profilului de la Malul Galben—Mitoc (Valea Prutului)*, in *AȘU — Iași*, secț. II (Științe naturale), 6. Geologie—Geografie, XI, 1965, pp. 208 sq ; C. S. Nicolăescu-Plopșor, N. Zaharia, *Raport preliminar asupra cercetărilor paleolitice din 1956*, in *Materiale*, V, 1959, pp. 34—38 ; C. S. Nicolăescu-Plopșor, N. Zaharia, *Cercetările de la Mitoc*, in *Materiale*, VI, 1959, pp. 11—19 ; V. Chirica, *Descoperiri paleolitice în așezarea de la Mitoc (jud. Botoșani)*, in *Arh. Mold.*, VIII, 1975, pp. 7—14 ; V. Chirica, *Le Paléolithique supérieur à l'Est des Carpates*, in *U.I.S.P.P., X^e Congrès*, Mexico, 1981, pp. 212—226 ; V. Chirica, *Amuleta—pandantiv de la Mitoc, jud. Botoșani*, in *SCI VA*, 33, 1982, 2, pp. 229—231 ; V. Chirica, *Amuleta—pandantiv de la Mitoc și unele aspecte ale artei și magiei în paleoliticul superior est-carpatic*, in *Studia Antiqua et Archaeologica*, I. Iași, 1983, pp. 38—44 ; V. Chirica, *Dalarea prin C-14 a unor locuri gravelliene de la Mitoc—Malul Galben, com. Mitoc, jud. Botoșani*, in *SCI VA*, 35, 1984, pp. 74—79 ; V. Chirica, *La chronologie relative et absolue des habitats aurignaciens et gravelliens de la Roumanie*, in *The World Archaeological Congress. The Pleistocene Perspective*, vol. 1, Southampton—London, 1986, 32 p. V. Chirica, *La genèse et l'évolution des cultures du Paléolithique supérieur dans la zone du Prut Moyen d'après les recherches récentes*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, 1987, pp. 25—40 ; M. Cărciumaru, V. Chirica, *Découverte d'art paléolithique sur le territoire de la Roumanie*, *ibidem*, pp. 63—72 ; V. Băcăuanu, V. Chirica, *Corrélations géomorphologiques — archéologiques dans le secteur épigénétique de la vallée du Prut*, *ibidem*, pp. 87—96 ; O. Necrasov, M. Știrbu, *Sur les faunes paléolithiques du Nord-Est de la Roumanie*, *ibidem*, pp. 105—112 ; T. Simionescu, *Nouvelles espèces de gastéropodes dans la terrasse pléistocène du Prut du Malul Galben—Mitoc (Départ. de Botoșani)*, *ibidem*, pp. 113—132 ; K. Honea, in *Arh. Mold.*, XIII, (ms.).

6. MITOC, COMMUNE OF MITOC, DISTRICT OF BOTOȘANI PÎRÎUL LUI ISTRATI

History of Research

During surveys on the Prut and Dniestr drainages, N. N. Moroșan identified the Pîriul lui Istrati site. It is situated about 1.5 km south of Mitoc on the left side of Istrati Creek which, a short distance away, flows into the Prut River. Terrace IV extends to both the north and south.

V. Chirica began systematic excavations there between 1972 and 1978.

Geological Stratigraphy

In 1902, geologist Ioan Simionescu stated that the bed of Istrati Creek had been cut into a series of limestone tiers of different consistencies. Over conglomerates with silex, there are diorite sands, tortonian limestone covered with grey diorite sands and oolitic limestone. The latter includes small gastropoda cemented in radial calcite. Many traces of foraminiferae are also present.

Studying the geological deposits, N. N. Moroșan established the following stratigraphy :

— vegetal soil ;

At a depth of 3—5 m, the loessoid clays produced silex pieces.

— loess, 3—5 m thick ;

— loessoid clays ;

— fine, clayey sand 1—2 m thick ;

— rolled terrace gravels.

As a result of our own studies, the following stratigraphic sequence was established in a profile of 8.50 m :

- 0.00—0.70 m, black dark grey earth containing a rich habitation (Cucuteni A habitation level and a few internments from the end of the Bronze age) ;
- 0.70—1.40 m, transition horizon (that of C type of chernozem) ;
- 1.40—1.70 m, redeposited loessoid sediments ;
- 1.70—2.00 m, horizon with calcium carbonate ;
- 2.00—3.15 m, loessoid deposit with CaCO_3 accumulations, very rarely with small calcareous concretions ; towards the lower part carbonates are more and more diffuse ;
- 3.15—3.60 m, loessoid sediments ;
- 3.60—4.05 m, horizon with very homogeneous accumulations of CaCO_3 ;
- 4.05—5.95 m, loessoid deposit, with diffuse accumulations of CaCO_3 ;
- 5.95—6.75 m, sediment of a darker colour similar to a fossile soil, but which is in lenticular form, sometimes occurring with several lenses. Between them is a deposit of lighter colour, of sandy — clayey materials ;
- 6.75—8.50 m, grey horizon darker at the base superposed over sands and rolled gravels. At the base of the terrace there are calcareous rocks and sands rich in CaCO_3 . This sedimentary sequence is inclined to the Prut in the east due to the limestone bedrock.

Archeological Stratigraphy

Palaeolithic habitation surfaces begin at a depth of 1.40 m and continue with very little discontinuities down to 4.20 m. Some isolated silex pieces and even finished tools were discovered at 6.20 m. Considering the presence of a succession of lithic workshops as a stratigraphic criterion, we identified four habitation levels :

- level I, an Upper Aurignacian surface, stratigraphically situated in the lower part of the horizon with homogeneous accumulations of CaCO_3 and at the upper part of the loessoid deposit, between 1.20—3.80 m ;

- level II, assigned to the Lower Gravettian, situated at a depth of 3.60—2.80 m ;

- level III, probably belonging to a Middle stage of the Gravettian, situated between 2.50—1.70 m ;

- level IV, belonging to the Final Gravettian, situated in a soliflucted deposit, at 1.40 m.

There are no important differences between the technical and typological features of these Gravettian surfaces. They only are mentioned in the below paragraphs.

Habitation Complexes

We found at a depth of 3.45 m and 3.60 m, respectively, the remains of a possible habitation complex. It occupied an oval surface, 2.20×3.50 m, the outline of which was determined thanks to ash traces. This structure contained a lithic workshop with about 336 silex pieces : 2 nuclei, 7 unre-

touched middle flakes, 20 unretouched lamellar flakes, 72 unretouched blades (48 middle ones, 3 „crested“. 21 microlithic, 1 dihedral burin on a middle decoration blade with some retouch on a portion of the left end as well as 234 splinters and flakes). A former hearth may be indicated by a scatter of charcoal. Second structure contained numerous fragments of bones superposed above silex pieces or viceversa. Due to poor preservation only the vertebrae of a big herbivorous animal (*Bos s. Bison*) and a few femur ends were found. This complex occupies a surface of 16 sq. m and contained a lithic workshop made up of 166 atypical pieces, most of them very sharp, although unretouched and splinters: 1 nucleus, 13 small and middle flakes, 2 lamellar flakes 33 middle blades and 29 microlithic ones, one of which was calcined, all of them unretouched, 3 burins, of which 2 were on flakes and 1 on a middle decoration blade (angle on truncation and multiple dihedral), and a gritstone slab used as an anvil.

A hearth was near the workshop. It had an oval shape, a diameter of 0.40×0.60 m, and was 0.10 m deep. It contained fragments of charcoal, ash, bones and calcined silex. The hearth in this shelter is the only one better preserved but the quantity of charcoal collected on it was insufficient for C-14 analysis. In other levels hearths were severely eroded so that only isolated carbon fragments were left.

Much more numerous were silex workshops, their presence being a characteristic feature of Paleolithic habitations at Mitoc, irrespective of their cultural assignment. In this site, 10 workshops had around them 1–5 limestone or gritstone slabs used as anvils and 26 were mere concentrations of lithic materials on very reduced surfaces. The following workshops are to be mentioned:

- workshop 4, situated at a depth of 3.11 m, with an anvil of 27×15 cm and 797 pieces of which 713 are atypical, on a surface of only 55×50 cm;
- workshop 19, at a depth of 1.75 m; on a surface of 70×75 cm it containing 765 pieces of which 493 are atypical, the rest of them being debitage
- workshop 33, situated at — 1.70 m at a 4.00 m's distance from the preceding one, occupying a surface of 1.45×0.50 m, with 798 pieces of which 651 are atypical.

Related to the 3 Gravettian levels, the situation is as follows: level II, 24 workshops; level III, 3 workshops; level IV, 4 workshops. As a whole the 36 workshops found at Piriul lui Istrati contained: 8,118 atypical pieces, 171 nuclei, 429 flakes, 445 lamellar flakes, 594 microlithic blades, 1,613 middle blades, 62 microlithic blades and 57 crested ones, as well as 3 end scrapers (workshops 11, 17, 35), 2 sidescrapers (workshops 10, 33), a backed blade (workshop 24), 1 end scraper — burin (workshop 34), 5 burins (workshops 27, 33, 35).

Palaeofauna

Some palaeofauna remains were discovered in Gravettian levels but due to poor preservation very few could be properly identified. The following species should be mentioned: *Bos primigenius*, *Bison priscus* and *Equus transilvanicus* Teodoreanu. The presence of the species *Cervus elaphus* and *Rangifer tarandus* in the level assigned to the Middle Gravettian as well as of an omoplate and of two metacarpians of *Rhinoceros tichorhinus* in the same level

shows both a period of periglacial climate and the existence of moments when in the Prut neighbourhood there were marshy areas. The big herbivorous animals, easily adaptable to the climate changes survived in periods both anterior and posterior to the last glacial stade.

Lithic Assemblages

Except for the large site at Malul Galben-Mitoc, Gravettian habitation surfaces at Piriul lui Istrati represent — up to now — the largest series of workshops in Romania. The variety and richness of finished tools, however, cannot be matched except by habitation levels in the Bistrița River region.

Level II

— Pieces found in workshops :

— atypical pieces	4,481
— unretouched microlithic blades	251
— unretouched middle blades	473
— unretouched blades	8
— unretouched flakes	97
— unretouched lamellar flakes	137
— crested blades	13
— intact or fragmentary nuclei, most of them prismatic or pyramidal, some of the exhausted	37

— Pieces found in culture stratum :

— atypical pieces	666
— unretouched microlithic blades	76
— unretouched middle blades	282
— unretouched macrolithic blades	13
— unretouched flakes	84
— unretouched lamellar flakes	56
— crested blades	6
— nuclei	34

Retouched tools : 14 burins (angle on a break, dihedral, double ones, two of them being discovered in workshops 35 and 37), 2 end scraper-burins, 15 end scrapers (most of them simple convex ones, 1 concave and a „fanned“ one, two of them being discovered in workshops 35 and 11), 11 partially retouched flakes and blades, with fine retouch (three of them belonging to workshops 21 and 35), 5 „à bord abattu“ bladelets (1 in workshop 24) and 8 sidescrapers (1 in workshop 10).

Level III

— Pieces found in workshops :

— atypical pieces	1,063
— unretouched microlithic blades	40
— unretouched middle blades	182
— unretouched microlithic blades	9
— unretouched flakes	25
— unretouched lamellar flakes	26
— crested blades	7
— nuclei	10

— Pieces found in culture stratum :	
— atypical pieces	450
— unretouched microlithic blades	62
— unretouched middle blades	183
— unretouched macrolithic blades	7
— unretouched flakes	64
— unretouched lamellar flakes	35
— crested blades	2
— nuclei	26

Retouched tools : 4 burins (an angle on retouched oblique truncation, angle on a break, a nucleiform and a dihedral one), 1 end scraper-burin (identified in workshop 34), 9 convex end scrapers (1 in workshop 17), retouched piece with fine retouch, 4 „à bord abattu“ blades and 2 perçoirs, one of which made through an encoch retouched on a partial „à bord abattu“ middle blade.

Level IV

— Pieces found in workshops :	
— atypical pieces	1,813
— unretouched microlithic blades	105
— unretouched middle blades	262
— unretouched macrolithic blades	11
— unretouched flakes	110
— unretouched lamellar flakes	125
— crested blades	8
— nuclei	49
— Pieces found in culture stratum :	
— atypical pieces	189
— unretouched microlithic blades	22
— unretouched middle blades	58
— unretouched macrolithic blades	6
— unretouched flakes	16
— unretouched lamellar flakes	22

Retouched tools : 3 burins, of which an angle on a break and a dihedral one, discovered in workshop 33, a sidescraper (in workshop 33), 5 end scrapers (among which a carinated one) and 2 pieces with fine retouch (in workshop 33).

Bone Tools

As a result of the researches in the faunal material we identified fragments (especially horns) that could be used as pickaxe-hammers, perçoirs, „piolets“ etc.

Other Discoveries

At a depth of 3.16 m we discovered a small agglomeration of red ochre which seemed to contain a few teeth that could not be identified. Mineralogic and spectral analysis show the red ochre to be the result of calcination of natural yellow ochre.

Conclusions

The Gravettian habitations at Mitoc-Piriul lui Istrati have the same distinctive, specific features never met before in other Gravettian sites. First of all, we mention the great number of lithic workshops. Most of them have one to five anvils and a very large quantity of waste or debitage products. Much debitage was found not only in the workshops but also in the cultural layer. Typical tools represent a negligible percentage of the total assemblages. Such a large amount of debitage cannot be explained but by the fact that the site is placed at only 4–5 km south from the rich silex deposits. That is why while south of the Moldavian Plateau this raw material of first quality was almost exhausted, in the Mitoc area several thousands of flakes and blades were left unfinished.

By studying the typological lists given above, it was realized that microlithic pieces represent very large percentages in comparison with the medium ones. This element should be interpreted as being due to the rich deposits of raw material. We mention the fact that macrolithic pieces are found in an even lesser proportion. From this point of view, especially because of their being close to the sources of raw material, these habitations could have had manifested macrolithism as their specific technological feature, represented in over 99% by the Buglovian silex from the base of the lower terrace of the Prut River.

The very small amount of finished pieces could be explained by their presence in contemporary settlements on the Bistrița River terraces in the Ceahlău area. Here, end scrapers, burins, „à bord abattu“ blades and Gravette points are sometimes found in highest proportions. The absence of specific Gravettian pieces could be compensated by the great number of middle blades (slender, thin and elongated). These were no longer turned into finished pieces maybe due to the forced abandoning of the site on account of climatic factors.

Level II, which we assigned to an early stage of the Gravettian seems to be synchronous with unperiodised Gravettian level I at Malul Galben-Mitoc. It contains the most numerous Gravettian elements. But, owing to the presence of the 8 sidescrapers on flakes and nuclei, we realize that these types specific to the Middle Paleolithic period were still in use, which gives the tools an archaic character.

This level also contains the most numerous „à bord abattu“ blades, completely absent in the other habitations we assigned to the Upper Aurignacian (level I). From this point of view, we appreciate that this level can be geochronologically integrated into the period of the climatic oscillation Ohaba B (Stillfried) — Denekamp 2 dated at Malul Galben to about 27,000 B.P.

Level III could be included in an evolved (middle) stage of the Gravettian, relatively dated to Herculane I (Tursac) climatic oscillations, that is about 23,000 B.P. In this level, the „à bord abattu“ blades are quantitatively diminished and pieces in the Mousterian tradition are no longer present, even if the percentage of flakes is relatively high.

Finally, level IV can be assigned to Tardiglacial, probably to Românești (Lascaux) oscillation. The pieces specific to the Final Gravettian are completely absent in this level, a sidescraper and a carinated end scraper

being found among the materials of older tradition. The stratigraphic position of this level doesn't allow an earlier dating; moreover, on the basis of pollen analyses, this stratigraphic sequence was assigned to the Holocene, which we consider to be too late if related to the features of the lithic assemblages.

Turning to the climatic factors, we should not forget that Piriul lui Istrati is in the immediate vicinity of the Prut River which often doubles or even triples its flow, due to the periods of intermittent rains. The same phenomenon could have happened in various stages of the interstadial periods, when its confluence with Piriul lui Istrati could take place upstream of the site we have studied. Therefore, the human groups were compelled to abandon their habitation because of the big floods. These climatic elements determined geological phenomena. The sediments between culture strata were greatly diminished by erosion, which affected the habitation remains (the situation of hearths is convincing enough in this respect). The frequent abandonings of settlements must not be explained only by climatic changes even if there were periods similar to Würmian stads. They can also be explained by the fact that the settlements were too close to the Prut River which, through its largely open valley at the confluence with Piriul lui Istrati, could overflow upstream and produce catastrophic inundations during the last interstade or Tardiglacial.

References

I. Simionescu, *Constituțiunea geologică a țărmului Prutului din nordul Moldovei*, in *Ac. Rom., Publicațiunile fondului „V. Adamachi”*, II (1901—1906), București, 1908, p. 40; N. N. Moroșan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est*, in *Anuarul Institutului Geologic al României*, XIX, 1938, p. 55; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, vol. I—II, București, 1976; V. Chirica, P. Șadurschi, *Descoperiri paleolitice și postpaleolitice la Mitoc—Piriul lui Istrati—jud. Botoșani*, in *Hierasus*, Anuar '78, I, 1979, pp. 63—74; V. Chirica, *Les recherches paléolithiques de Mitoc—Piriul lui Istrati*, in *Coll. Int. L'Aurignacien et le Gravettien (Périgordien) dans leur cadre écologique*, Krakow, 1981, pp. 7—20; V. Chirica, *La genèse et l'évolution des cultures du Paléolithique supérieur dans la zone du Prut Moyen*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, 1987, pp. 25—40; M. Cârciumar, *L'environnement et géochronologie du Paléolithique et Epipaléolithique de la Roumanie*, *ibidem*, pp. 97—104; O. Necrasov, M. Știrbu, *Sur les faunes paléolithiques du Nord—Est de la Roumanie*, *ibidem* pp. 105—112; V. Băcăuanu, V. Chirica, *Corrélations géomorphologiques — archéologiques dans le secteur épigénétique de la vallée du Prut*, *ibidem*, pp. 87—96; M. Cârciumar, *Paysage paléophytogéographique, variations du climat de Roumanie (Etude polynologique)*, in *Dacia*, N. S., XXIII, 1979, pp. 21—29.

7. RIPICENI, COMMUNE OF RIPICENI, DISTRICT OF BOTOȘANI GROTA STÎNCA-RIPICENI

History of Research

N. N. Moroșan undertook systematic researches here in 1924 and 1925—1926. He found the only cave-site inhabited by Paleolithic populations in the east-Carpathian area. „Stînca“ is a calcareous hill of a type frequently encountered on the Middle Prut River. It was assigned to Sarmatian.

N. N. Moroşan identified on the southern slope of the hill a crevice in the mass of reef-limestone with a west-east orientation. It was situated at an absolute altitude of about 150 m and a relative altitude of about 40 m (against the level of the Prut). It was 1 m wide and had two apertures : the first situated at the present level of the soil, the second to the upper part of the hill. N. N. Moroşan investigated only a limited area in its western extremity because the rest of the „channel“ (16 m long) was destroyed during the exploitation of limestone begun in 1902.

Geological and Archeological Stratigraphy

The first geological stratum situated at the lower part was made up of limestone from the floor or walls. N. N. Moroşan identified 7 levels. Levels I, III, V, VII had traces of human habitation. They were separated by levels II, IV and VI, archeologically and faunally sterile.

Level I is 1.22 m thick, 1.32 m wide and 2.20 m long. N. N. Moroşan considered the sediments in the cave to be of Aurignacian origin, when the first populations settled here. Lithic and bone tools and very rich faunal remains made him include this stratum in Upper Aurignacian.

Level III, 1.50 m thick contains the same traces of human habitation. Hearths are missing. However, isolated charcoal fragments were found. They were used to identify arboricultural species. N. N. Moroşan assigned it to late Upper Aurignacian. Actually, it belongs to Gravettian.

Level V is 0.45 m thick, 1 m wide and 1.70 m long. This habitation level has the same general features as the lower strata. Possible adornment pieces were found here. It was assigned to a Gravettian developed stage.

Level VII is 0.85 m thick, 0.70 m wide and 2.00 m long. It is superposed on other rock fragments from the ceiling of the cave. This phenomenon may have taken place during the habitation period, because limestone both superposed and was superposed by archeological material. No compact archeological material, hearths included, were found. The absence of the first category of habitation complexes is normal given the limited surface of habitation area. No special shelters could be raised because of the specific features of the cave. N. N. Moroşan assigned this habitation area to Final Gravettian.

Sterile strata are 0.82, 0.90 and 1.45 m thick. They prove the existence of rather long periods when human populations abandoned this natural shelter.

A hearth was found outside the cave, close to its upper aperture. Burnt fragments found in all levels and bits of charcoal in level V only come from coniferae species.

Palaeofauna

But for those at Mitoc-Malul Galben, varied faunal remains found on habitation surface of the cave at Stînca-Ripiceni are the richest for the whole Romanian Gravettian.

Level I. Gasteropoda : *Pupa muscorum* and *Helix hispida* ; mammals : *Equus caballus fossilis* (about 50 individuals), *Bos primigenius*, *Bison priscus*, *Cervus elaphus*, *Capreolus capreolus*, *Arctomys bobac*, *Canis vulpes* and *Felis leo spelaea* (2 individuals of different ages).

Aurignacian lithic pieces : nuclei and debitage, unretouched blades, with retouched truncation or carving retouch, end scrapers, some of which carinated, burins, double on retouched concave truncation included. Bone fragments revealing human intervention and perçoir-like pieces were also found.

Level III has shells of *Pupa muscorum*, *Helix pomatia* and *Helix hispida*, entire or broken.

Of a peculiar importance is the presence of bird bones : raven and pigeon (Colombidae). Mammals : *Equus caballus fossilis*, *Equus hemionus*, *Bison priscus*, *Cervus elaphus*, *Rangifer tarandus*, *Arctomys bobac*, *Lepus timidus*, *Canis lupus*, *Hyaena spelaea*. Horse is not very well represented in this level. There is an increased proportion of bovines. The presence of reindeer bones may allow us to identify climatic alterations.

Level V contains the same gastropoda as levels I and III. Bird bones of *Vultur fulvus*. Mammals : *Canis lupus*, *Canis vulpes*, *Rangifer tarandus*, *Marmota bobac*, horses and bovines. Marmot, an animal specific to alpine areas and reindeer confirm the existence of less favourable climatic conditions.

Level VII has fewer faunal remains. Gastropoda and birds are missing. Mammals are represented only by horse (dentition fragments).

Lithic Assemblages

Most of the silex pieces found in level I (over 80% from the total of about 1,000 pieces) are debitage. Bifacial and even amygdalaceous nuclei were found. They were used to obtain high, carinated end scrapers similar to those at Mitoc-Malul Galben. A large number of blades, most of them unretouched or with carving retouch, end scrapers on blades and angle on a break, on truncation or dihedral burins were also found.

Level III contains a great variety of nuclei some of which could be turned into nucleiform end scrapers. There were also found nosed end scrapers (ogival, convex and on blades), retouched or partly retouched blades (among which a „pointed“ piece particularly well executed), 12 burins („busked“, angle on a break and nucleiform). „Burin blow“ bladelets show the existence of a greater number of such pieces than those found by N. N. Moroşan. „Backed“ blades and Gravette points give this level a Gravettian aspect.

Level V. A smaller quantity of pieces were found here ; only about 50% of them are tools : convex or ogival end scrapers on retouched blades, end scraper-burins on unretouched middle blades, burins (whose number is double : „flute beak“, double angle on a break or on oblique retouched truncation). N. N. Moroşan also presents a double piece of convex sidescraper-angle burin type on a massive decortication flake. Quite numerous „dagger“ blades seem to belong to this archeological level, too. It is very interesting the attempt at obtaining a „shouldered point“ known later on through the numerous discoveries at Kostenki. Quite numerous „backed“ pieces and Gravette points (although not so well represented as in level III), reveal a microlithization tendency.

Level VII contains about 100 pieces. Almost half of them are finished tools : convex end scrapers on blade points (10), burins („flute beak“, multifaceted or „busked“). Perçoirs on long thin blades and the great amount of Gravette points suggest a possible steep retouch. Microlithization, especially

that of „backed“ blades, tends toward the „pigmy“ type specific to epipaleolithic habitats (like those found in Final Gravettian habitation at Recea-Tibănești).

Bone Tools

In level I only fragments of bones were found. They had incisions made with sharp, cutting silex and perçoirs of horse or bovine metacarpians. A cavern lion canine reveals traces of human intervention.

Level III also contains perçoirs made of horse or bovine metacarpians. A sharpened *Cervus elaphus* antler looks like those found at Predmosti and Cotu Miculinți. Other bone fragments show traces of deliberate but not finished processing.

Level V is richer in pieces made of big herbivorous animals bones. A „rod“ bearing traces of longitudinal scraping, sharpened at both ends, looks very much like the spear points found at Cotu Miculinți and Crasnaleuca. Stag antler fragments are quite numerous. They are sharpened at one end and were probably used to dig up roots and tubers. Pieces known as „marshall truncheons“ or „sceptres“ were also found.

Level VII has no tools or weapons resulted from bone or horn processing.

Other Discoveries

Gritstone and quartzite gallets identified in levels I and V and 20 silex blades deposited in level VII can be included here. Some possible adornment pieces were also found : a fox and a wolf canine and a *Helix* shell, all perforated, and some lumps of iron oxide probably used at dying.

Conclusions

Ever since 1932—1933, N. N. Moroșan has made a most complete and elaborated description of such cultural complexes found in a Paleolithic site. Based on systematic research, scientific approach and interdisciplinary study it still represents a model in this field. As both geologist and archeologist, N. N. Moroșan could well corroborate data offered by archeological and geological stratigraphy. He also made, together with S. Leclercq, the first determinations of Quaternary flora on the basis of coal samples from Paleolithic hearths.

His cultural assignments may surprise us today, but they were correct at the respective time. The cultural values he attributed to the first habitation level are still in operation. Recent typological and technical research assigned levels III, V and VII to Middle, Upper and, respectively, Final Gravettian, according to the present scheme of Gravettian on Bistrița River terraces. To support these cultural assignments, a very exact and detailed description of each stage of Gravettian culture is needed. Without an exhaustive publication of lithic complexes according to modern typological criteria, a systematization of east-Carpathian Gravettian is difficult to achieve.

There are certain differences between levels III, V and VII at Stinca-Ripiceni which could represent different cultural-chronological stages. Thus, the archaic character of all tools in level III would assign it to an Aurignacian

stade. But the „backed“ pieces pertain to a similar dating as some levels at Cotu Miculinți and Crasnaleuca, whose planes and perçoirs assigned them to an evolved Gravettian stage. The much neater execution of end scrapers and burins on retouched oblique truncation and the slender symmetrical shape of „backed“ bladelets in level V led to its assignment to a much more evolved stage of this culture. The presence of „shouldered“ pieces can be understood only if we consider N. N. Moroșan's remark regarding the presence of silex pieces which don't originate in Middle Prut River area. One may suppose that the human population here came during an evolved Gravettian stage from an eastern area (the Dniepr), but in a more recent period marked by the presence of reindeer and marmot as hunted game. It means that when level V was inhabited, the Middle Prut area (the culture strata at Mitoc-Malul Galben, Crasnaleuca and Cotu Miculinți, where the reindeer remains were found) had a periglacial climate. Consequently, the habitation level could belong to a period between the last glacial sequence of Würm III and the first Tardiglacial climatic oscillation, eventually between the climatic oscillations Herculanian I and II established by M. Cărciumaru (the interval between Laugerie and Lascaux climatic oscillations).

The last level really belongs to Final Gravettian. It is subsequent to the discoveries at Ripiceni-Izvor and Valea Badelui. Pieces of geometrical shape which will frequently be encountered in epipaleolithic cultures were not found. However, the presence of „pigmy“ pieces is a feature of Final Gravettian. This applies especially to the area rich in first quality raw material where microlithization had not reached such a high degree as in other areas (south of Moldavian Plateau). We must also consider the limited character of investigations (between 1.30—0.70 m) compared to the whole habitation area of about 15—16 m. The loss of this archeological station of utmost importance the only of the kind in the whole east-Carpathian area of Romania, was detrimental to the value of specific researches.

References

N. N. Moroșan, *Contribuțiuni la cunoașterea paleoliticului din nordul Moldovei (malurile Prutului)*, in *Ac. Rom., Memoriile secțiunii științifice*, tom. IV., mem. 7, 1927, 18 p; idem, *La station paléolithique de Stîlca—Ripiceni*, in *Dacia*, V—VI (1935—1936), pp. 1—22; idem, *Le Pléistocène et le Paléolithique de la Roumanie du Nord—Est*, in *Anuarul Institutului Geologic*, XIX, 1938, pp. 8—32; Suzanne Leclercq, N. N. Moroșan, *Contribution à la connaissance de la flore du Pléistocène de la Roumanie du Nord—Est*, in *Comptes rendues des séances de l'Institut Géologique de Roumanie*, XXI, 1933, pp. 111—116; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, București, 1976, pp. 223—224; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 120—122.

8. RIPICENI, COMMUNE OF RIPICENI, DISTRICT OF BOTOȘANI LA IZVOR

History of Research

Ion Simionescu — geologist — was the first to signal in the first years of our century, the presence of some paleontological remains belonging to mammoths at this site in the Middle Prut River. In 1908 and 1912, P. Encu-

lescu and E. Protopopescu-Pache discovered several silex pieces near Stinca-Ripiceni limestone knoll on the occasion of agrogeological measurements. From 1919, the whole depression of the Middle Prut was systematically studied by N. N. Moroşan — a geologist and archeologist.

In 1919 he discovered traces of Pleistocene fauna on the lower terrace of the Prut, near La Izvor, a perinneeal spring. The site became known as Ripiceni-Izvor. As a result of his sondages made in 1925 and subsequently between 1928 and 1930 N. N. Moroşan established the presence of habitation levels attributed to both Middle and Upper Paleolithic periods. Between 1961—1981, Al. Păunescu was to systematically excavate the largest Paleolithic establishment in Romania. It is now flooded by waters of the Costeşti dam. It was situated on the lower terrace (1) of the Prut River at 13 m.

Geological Stratigraphy

N. N. Moroşan specified that the lower terrace of the Prut, in Ripiceni-Izvor area, contained Quaternary sediments over those from the Miocene age. He distinguished the following geological strata :

- 0.00—0.45 m, vegetal soil containing traces of post-Paleolithic habitation ;

- 0.45—1.08 m, loess with infiltrations of humus and Sarmatian limestone blocks ; with traces from the Neolithic age in an upper level and „Magdalenians“ between 0.60—0.85 m ;

- 1.08—3.75 m, rather sandy, light yellow loess ; between 1.50—3.00 m traces of Upper Paleolithic ;

- 3.75—4.28 m, yellow loess containing silex pieces from the Aurignacian ;

- 4.28—4.69 m, loessic, yellow — green, black — stripped clay (maybe due to CaCO_3 pigmentations) ;

- 4.69—5.29 m, compact, yellow — green, black — stripped loessic clay containing in its upper part a fossil soil ; the whole layer contained archeological materials from the Upper Mousterian ;

- 5.29—6.29 m, grey-green, compact loessic clay ; sometimes, it reached a thickness of 1.50 m ; there was a fossil soil at the bottom of this layer ; clay was sandy or pure enough or with calcareous concretions ; at the bottom, there was a colour resulting from iron oxides and from carbonates ;

- 6.29—6.74 m, loess rich in iron oxides ;

- 6.74—7.00 m, green — violet loess ;

- 7.00—7.85 m, stratified sand ; it could be pure or contain iron oxides providing a specific colour ;

- 7.85—8.15 m, loessic sand mixed with sand ; traces of *Elephas primigenius* and *Rhinoceros tichorhinus* ;

- 8.15—11.00 m, gravel from the terrace, mixed with clay and sand ; traces of *Elaphus primigenius*, fossil horse and Levalloisian pieces ;

- 11.00—12.50 m, limestone rocks from the Sarmatian ;

- 12.50 m, the lowest level of the Prut River, at 75 m above sea level.

In his turn, Al. Păunescu identified the following geological sediments in a vertical section of about 12—13 m :

- dark — black vegetal soil with croton vines ;

- gray — black soil ;

- loess degraded by humus infiltrations ;
- light -- yellow loess containing crotonines ;
- reddish loess ;
- light-yellow loess ; there is a reddish colour coming from iron oxides ;
- dark -- reddish soil ;
- dark yellow--reddish soil ;
- light yellow--reddish soil with limestone rocks ;
- dark brown loessic clay with small limestone rocks ;
- four lensy veins containing clay or sand ;
- light brown clay ;
- sandy, stratified, yellow --reddish clay ;
- sandy, stratified, yellow --green clay ;
- gravel containing sandy clay and fine sand ;
- the base made of Sarmatian limestone.

Archeological Stratigraphy

N. N. Moroşan identified, based on the then up-to-date research, four habitation layers :

- Upper Levalloisian,
- Upper Mousterian.
- Aurignacian and
- Magdalenian levels, thus covering almost all of the Paleolithic period.

Al. Păunescu's systematic excavations, in an area larger than 3,000 sq. m. revealed the following archeological levels :

1. Pre -- Mousterian level ; about 0.30—0.50 m in thickness ; it was situated at the upper limit of terrace gravels and contained the Levallois or Clactonian techniques ; these pieces are in secondary positions and exhibit traces of rolling ; *Mammuthus primigenius* and *Bos s. Bison* remains were also found.

2. First Mousterian level was sometimes right over terrace gravels ; thickness about 0.35 --0.90 m ; it contained Levallois flakes and points, Mousterian points, sidescrapers, etc. ; fauna : *Mammuthus primigenius*, *Coelodonta antiquitatis*, *Rangifer tarandus*, *Megaloceros*, *Equus caballus*, *Asynus hydruntinus*, *Ursus spelaeus*, *Canis lupus*.

3. Second Mousterian level ; thickness 0.55—0.90 m ; it contained almost the same kind of pieces, but in larger quantity ; fauna was represented, except for the mammoth, by *Bison priscus*, *Bos s. Bison*, *Equus caballus*, *Crocota spelaea*, *Canis lupus*.

4. Third Mousterian level ; thickness 0.40 --0.90 m ; hearths and various lithic pieces ; fauna included, besides the already known species, *Rangifer tarandus*, *Alces alces*, *Cervus sp.*

5. After a sterile level of 0.70—1.00 m in thickness, there was the fourth Mousterian level (thickness 0.85--0.95 m). It was the richest Mousterian level in the site. Lithic workshops, hearths and many varied lithic tools were identified (they included leaf shaped points and bifacial pieces, sidescrapers ; also found were end scrapers, burins, perçoirs) ; habitation complexes and traces of specially arranged dwellings ; fauna, as in the lower levels, was represented by *Mammuthus primigenius* and other previously known species.

6. Fifth Mousterian level had a thickness of 0.40—0.80 m ; not so rich in archeological pieces as the third and fourth levels ; groups of limestone blocks having the looks of deliberate buildings were identified ; fauna : not difference in relation with the other levels.

7. Sixth Mousterian level had sporadic habitation traces ; it came after a sterile layer 0.75—1.05 m thick. Compared to the previous levels, not only were dwellings missing but also hearths.

8. Aurignacian levels came after a sterile layer of about 0.50—0.80 m thickness ; this level, divided into two parts, was of 1.20—1.65 m thickness ; only one hearth and some groups of stones, debitage waste ; fauna included traces of *Equus caballus fossilis*, *Bos s. Bison*, *Cervus elaphus*, *Sus scrofa*. All this emphasize the existence of some habitation complexes. Charcoal from a hearth situated at a depth of 4.10 m, gave an age to this level of 28.420 ± 700 B.P. (Bln - 809).

9. Gravettian levels of 0.50—1.00 m thickness ; directly above the Aurignacian levels. Quoting Al. Păunescu. M. Brudiu agrees to the existence of four Gravettian levels. Though in his latest works Păunescu gave up this delimitation. He now noticed a level (called II b) that should be included in the Final Evolved Gravettian. Thus he gave way to the discovery of several cultural strata.

The Gravettian habitation ground is characterized by many and various lithic tools and by the incidence of some limestone groups (habitation surface ?). There are no hearths, though some silex pieces are calcined. From the point of view of geological stratigraphy, this level of 1.10—1.90 m thickness is located in a dark-olive sedimentary loess mixed with clay containing carbonate accumulations by many crotonines. Habitation complexes are almost entirely missing, except for groups of limestones blocks.

Palaeofauna

In the stratigraphic sequence occupied by Gravettian habitations there were found traces of malacological fauna : *Cepaea vindobonensis* and *Helix pomatia*, and of mammal fauna : *Equus caballus fossilis* and *Bos s. Bison*. But, when compared to the thickness of the culture layer, these traces are too scarce.

Lithic Tools

Only partly published, the lithic Gravettian tools found at Ripiceni-Izvor have all the features of this culture : „à bord abattu“ type blades and Gravette points, percoirs, simple or double burins, dihedral and angle on retouched truncation ones, end scrapers, end scraper-burins, denticulate pieces and circle segments, as well as several bifacial pieces. To all these we can add flakes and unretouched blades, nuclei or debitage pieces. Our attempt at classifying these pieces led to the following list :

- simple end scrapers on blade or blade-end with their active face convex ;
- atypical end scrapers ;
- nosed end scrapers ;
- double end scrapers ;
- ogival end scrapers ;

- end scrapers on retouched blade ;
- circular end scrapers ;
- carinated and nucleiform end scrapers ;
- straight dihedral. angle dihedral and multiple dihedral burins on flakes or on unretouched blades ;
- angle on a break burins ;
- burins on retouched truncation ;
- double and multiple dihedral burins ;
- mixed multiple burins ;
- end scraper-burins ;
- backed bladelets ;
- Gravette points ;
- end scraper-perçoirs ;
- perçoir on micro-Gravette blade ;
- notched pieces ;
- Périgordian shouldered points ;
- denticulate bladelets ;
- leaf shaped pieces ;
- circle segments ;
- Dufour bladelets ;
- truncated pieces ;
- Azilian-like points.

Bone tools-were completely missing (this is not a special case, as other Gravettian habitation surfaces also miss them).

Other Discoveries

We can include herein limestone chunks ; some of them could have been used as anvils, but they could also belong to improvised habitations.

Conclusions

Gravettian habitation levels raise some problems in various areas, but especially in geochronology and cultural features.

Based on his data from an in depth study of stratigraphy, lithic techniques and typology, Al. Păunescu (1976) established Ripiceni-Izvor level as belonging to an evolved Gravettian phase. Afterwards (1984), he presumably established level II b to belong to a final stage of Epigravettian.

The sediment forming conditions of geological layers of the lower terrace's forming epoch (before its turning up as a geomorphological unit) had as result the fact that the thickness of cultural layer was not all the same. There could be on this profile of 0.50—1.00 m thickness several habitation levels, but they don't make up real chronological and cultural units. Such an opinion is supported by the tendency of making this lithic material uniform. The lack of sterile layers between habitation levels and between Aurignacian and Gravettian levels in this site emphasize the action of intense erosion and transport phenomena. These phenomena could have happened during the last Würm stade, when human groups left most of their settlements from these regions affected by the advancing glacial cap. Therefore, in our opinion, there must have been a sterile layer between the Aurignacian and Gravettian levels

at Ripiceni-Izvo dating from that "Valdai-Maximum" stade (20,000—18,000 B. P.) which affected the whole Europe, except for its southern zones. The lack of cold climate fauna can support this opinion. We think that in establishing the Gravettian constituents, the area including Ripiceni-Izvor didn't belong to any periglacial climate like those at Crasnaleuca and Cotu Miculinți. Therefore, Gravettian habitation levels at Ripiceni-Izvor could date from a period after the fourth level at Crasnaleuca-Staniște-Lutărie and be somehow contemporary with the first two habitation levels at Lespezi.

As a result of his polynological analyses, M. Cărciumaru has stated that these habitation levels are to be dated to the second part of Herculan II and to the Românești climatic oscillations. The period between them is characterized by a slight deterioration of the environment. M. Cărciumaru has also stated that the beginning of these cultural levels are to be placed in the earlier Herculan I climatic oscillation (relying, maybe, on the lack of sterile layers between Aurignacian and Gravettian levels).

In our own opinion, this statement (that Ripiceni-Izvor Gravettian dates from the Românești climatic oscillation in connection with Lascaux climatic oscillation) would rather indicate the real age of the habitation establishment. Obviously, a detailed description of cultural elements would be necessary for a more accurate geochronological integration, a description based on technical-typological criteria of lithic grounds; but such criteria have not been published yet. Al. Păunescu also noticed (in a study from 1984) the presence of a „II b“ level established to date from the Final Epigravettian. This idea gives way to new interpretations, since it is not well specified whether this level is a limit of a Gravettian level or a real habitation surface, as its features show. There is no specification as regards the relation between level II b and the Gravettian level, either. This had been done earlier in 1976. The author stated only that Ripiceni-Izvor habitation level is located among habitation levels of the Final Epigravettian, (level II — Gravettian level — the upper II b level).

References

- I. Simionescu, *Constituțiunea geologică a țărmului Prutului din nordul Moldovei*, in *Ac. Rom., Publicațiunile fondului „V. Adamachi“*, tom II, 7, București, 1902, pp. 27—53; N. N. Moroșan, *Contribuții la cunoașterea paleoliticului din nordul Moldovei (malurile Prutului)*, in *Ac. Rom., Memoriile secției de științe istorice*, tom IV, mem. 7, București, 1927, pp. 7—18; idem, *Evoluția cercetărilor preistorice-paleolitice din România N. E. și rezultatele obținute*, Chișinău, 1933; idem, *Le Pélisocène et le Paléolithique de la Roumanie du Nord-Est*, in *Anuarul Institutului Geologic al României*, XIX, București, 1938, pp. 34 sq; Al. Păunescu, *Sur la succession des habitats paléolithiques et postpaléolithiques de Ripiceni—Izvor*, in *Dacia*, N.S., IX, 1965, pp. 22—25; V. Chirica, *Piese bifaciale din paleoliticul superior descoperite în regiunea de nord a Moldovei*, in *SCIV*, 24, 1973, 1, pp. 93—101; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, vol. I, București, 1976, pp. 225—228; Al. Păunescu, Ana Conea, M. Cărciumaru, Venera Codarcea, Al. V. Grossu, R. Popovici, *Considerații arheologice, geocronologice și paleoclimatice privind așezarea Ripiceni—Izvor*, in *SCIVA*, 27, 1976, 1, pp. 5—22; Al. Păunescu, V. Chirica, *Cercetări arheologice recente în zona Prutului Mijlociu*, in *Ac. Rom., Memoriile secției de Științe istorice*, S. IV, tom II, 1977, pp. 75 sq; M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova*, București, 1974, p. 127; Al. Păunescu, *Evoluția istorică pe teritoriul României din paleolitic până la începutul neoliticului*, in *SCIVA*, 31, 1980, 4, pp. 531—533; Al. Păunescu, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud european*, in *SCIVA*, 35, 1984, 3, pp. 248 sq; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 119—120.

9. RIPICENI. COMMUNE OF RIPICENI, DISTRICT OF BOTOȘANI VALEA BADELUI — LA CĂRĂMIDĂRIE

History of research

It is a Gravettian settlement discovered and investigated through systematic excavations by Al. Păunescu in 1970, over an area of 120 sq.m.

Geological Stratigraphy

In a 1.80--2.00 m section, the following sediments were identified :
— strongly eroded black chernozem (0.10—0.20 m thick) ;
— a transitional horizon to a yellow-black loess (0.10—0.18 m thick) ;
— soliflucted loess (clay-bearing, darkyellow material containing pieces of CaCO_3) : its thickness is 1.50 m.

Archeological Stratigraphy

Two Gravettian levels were identified : a lower one (0.30 m thick) is placed at the lower limit of the loess layer (between 1.30—1.50 m) and the second is placed in the upper surface of the loess layer.

Habitation Complexes

The entire archeological material from the lower level, concentrated in a rather oval area (3.80×4.00 m) gives the impression of a workshop — dwelling, without any special elements (traces of wall and roof-supporting poles, hearths, etc.). The workshop included 787 silex pieces. Some lithic materials were also found around (44 pieces altogether) : 6 unretouched blades, 1 nucleus and 37 debitage waste products. Hearths are missing, though some pieces seem to have been calcined.

Palaeofauna

In the first level faunal remains belong to the following species : *Equus caballus*, *Bos s.* *Bison*, *Bison priscus*, *Rangifer tarandus*, *Alces alces* ; in the second level bone traces of *Bison priscus* and *Coelodonta antiquitatis* were found.

Lithic Assemblages

Among the 787 pieces found in the lower level, 686 were debitage : flakes, lamellar flakes, atypical flakes. The following pieces have also been identified :

- 69 unretouched blades, some of which were crested ;
- 5 finely retouched blades, 1 with alternate retouch ;
- 1 partly denticulate blade ;
- 1 angle (on the flat face) burin ;
- 1 convex-convergent sidescraper ;
- 3 end scrapers (1 on a lamellar flake, with its active face convex, 1 high on flake, 1 sub-circular on a massive flake ;
- 4 Gravette points and “à bord abattu” blades, 3 of which with fine inverse retouch at the proximal side of the ventral surface, similar to those

found at Stinca-Ripiceni, Valea Ursului, Climente I -- Dubova or in Dniestr's area (Voronovița I, Babin I, Cormani) ;

— 17 irregular prismatic nuclei.

In the second level (a very poor one) only 41 silex pieces were found : 1 angle burin on a break, 15 unretouched blades and 25 pieces of debitage.

Conclusions

Because of the small number of typical tools one cannot integrate, from a cultural point of view, the first habitation level. This level could be integrated, however, on the basis of the features of its pieces, in a Final East-Carpathian Gravettian. This integration seems to be connected to the pollen determinations, which date the first level either to the Românești = Laugerie-lescaux climatic oscillation or to a stade of the pine phase (Tardiglacial).

The incidence of some bone traces belonging to the reindeer and traces of coniferae pollen (*Pinus*, *Picea*) support the dating of this habitation level to a cold climate (a transition period between Pleistocene and Holocene contemporary with phases of real climatic ameliorations).

The second habitation level (if it really existed) is certainly subsequent. The small number of materials could be, however, a result of erosion, transport and sedimentary processes.

References

Al. Păunescu, *Cercetări paleolitice în județul Botoșani (1970)*, in *Materiale*, X, 1973, pp. 10—13 ; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, București, 1976, p. 222 ; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 122—124 ; A. P. Cerniș, *Paleolit srednego Pridnestroviia*, in *Trudi komisii po izuceniju celverticnogo perioda*, 15, Moscova, 1959, pp. 18—26, fig. 8, 20—21 ; D. Praslov, *Paleolit istočnicov*, A 1—5, Moscova, 1964, pp. 38—41 ; V. Boroneanț, *Descoperiri gravettiene în peștera lui Climente*, in *Rev. Muz.*, 5, 1968, 6, pp. 542—546.

10. DOROHOI, DISTRICT OF BOTOȘANI STRAHOVA (STRACHINA)

A group of seven Gravettian sites are located in the area of Șendriceni commune, where the former village of Strahova was, near Dorohoi. They are known in archeological literature as "Dorohoi-Strahova (Strachina)" sites.

History of Research

Between 1964—1965, Prof. Gh. M. Vasiliu discovered three Gravettian settlements on the south western side of Dorohoi. During an archeological survey of Botoșani district several years later, three more settlements were discovered, all within several hundreds of metres from each other. The seventh site was subsequently found in 1974 by Gh. M. Vasiliu and Cristian Vasiliu.

In 1966, Al. Păunescu carried out limited sondages in the first and third sites. Ampler excavations were carried out in the second one.

All of them are placed on a rather high plateau separating Dorohoi town from the village of Șendriceni.

The second settlement, the richer of them, is situated on a slope of Polonicu hill, separating the Beldiman and Codău valleys. The following notes apply to this site.

Geological Stratigraphy

- vegetal soil ;
- dark yellow clay.

The archeological stratigraphy shows only one habitation stratum (15 — 30 cm thick) pertaining to the Final Gravettian in the second soil member.

It is worth pointing out in the Dorohoi-Strachina area, but in other areas as well (Dolhasca-Dealul văii/Valley's Hill/, Mitoc-Valea lui Stan, Recea-Țibănești, etc.) a substantial number of retouched tools and debitage found on the present-day surface. They are, however, naturally out of stratigraphic and cultural context. The original cultural strata were buried just under the surface and they found their way to the surface during solifluctional and slopewash processes.

Habitation Complexes

Workshops are represented by various worked lithic materials, including nuclei. The material used was Prut silex or menilite and silicic glauconitic gritstone. The latter rocks, of Carpathian origin, are minor in the assemblage (2%). Hearths and isolated charcoal are missing, although some silex pieces have been calcined.

Palaeofauna

This site is not much more different from others in the region : faunal remains are very scarce or completely missing. In the Strachina-Dorohoi second layer, only a few bone fragments were found, which could not be identified as species. Some *Equus caballus* molars were found, suggesting a steppe climate at the time of habitation.

Lithic Assemblages

Many kinds of retouched tools were associated with the second level. Some were on the surface, others were in the culture layer. Here is their list and incidence :

— finely retouched blades, with oblique retouch . . .	40...10 %
— “à bord abattu” blades, 3 truncated with retouched ends	106...26.5 %
— Gravette points	18... 4.5 %
— “Azilian” arched points with abruptly retouched lateral edges	5... 1.25 %
— blades with retouched oblique truncation (15), straight (7) and concave (7)	29... 7.25 %
— denticulate	6... 1.5 %
— “notches”	25... 6.25 %
— lances and “burin blow” type blades	5... 1.25 %

— perçoirs on blades	4... 1.00 %
— end scrapers on blades (53) and flakes (37) : 18 on retouched blades, most of them convex. Sub-types : high (5), shouldered (1), nosed (1), unguiform (8), concave (2), oblique (4), straight (1), double (4)	90...22.5 %
— end scraper—burins	2... 0.5 %
— transverse sidescraper on massive flake	1... 0.25 %
— burins : angle on a break (20), oblique retouched truncation (10), concave (4), convex (3), straight dihedral and curved (12), nucleiform (2), multiple (8), multiple-mixed (3)	65...16.25 %
— perçoir—burins	1... 0.25 %
— microlithic crescent-shaped piece	1... 0.25 %
— esquillee piece	2... 0.5 %
— retouched blades, of which 28 were crested ones . .	1,262
— nuclei : prismatic (17), pyramidal (9), irregular (33)	59
— unretouched flakes (5), some with oblique retouch (4)·	9

Out of an assemblage of 1,272 pieces found subsurface, 400 retouched tools were identified. The 1,200 pieces found on the surface were not counted statistically. Also, we have to notice that 55 % are microlithic pieces, 35 % are middle pieces and only 10 % are macrolithic ones.

Other Discoveries

Small fragments of red ochre (similar to some levels in Cotu-Miculinti Stinca-Ripiceni and Mitoc-Pirul lui Istrati) were found. A graphite fragment, of a long oval form, with four symmetric incisions, was considered as representing a Paleolithic art piece. The gritstone pieces, some of them with 12 × 20 cm dimensions, could have been used as anvils for making tools, an activity where hammers were also required.

Conclusions

Excavations in this site included an area of 310 sq.m. In the first and third sites, which were located at a distance of 300—700 m from the second one, sondages were limited. At a distance of 0.3—1.5 km from these the fourth and seventh sites are to be found, but the small number of pieces found at their surfaces did not seem to make excavations worthwhile.

At Dorohoi-Strachina, a group of seven Gravettian settlements were found, which seem to be contemporary to each other. This is a unique situation in this area, located on the border between the Moldavian Plain and Suceava Plateau. This could be identical with the Mălușteni zone (which see) in the southern part of the Moldavian Plateau.

This site (like the first, third and seventh) has been placed in the Final Gravettian phase. Criteria were based on typology and palynology analyses. The latter suggest the three sites can be placed in the pine-tree period of the Tardiglacial. However, the climatic oscillation can not be specified.

Some similarities with Crasnaleuca and Cotu-Miculinti might be tenable with their upper levels. The presence of crescent—shaped piece in the

Dorohoi site and in Ripiceni-Izvor one, leads us to believe that this cultural stratum is to be placed in one of the Tardiglacial climatic oscillations where thermophile plant species were prevalent (*Tilia*, *Quercus*, *Alnus*, *Ulmus*, *Salix*, *Betula*, *Abies*, *Carpinus*, *Acer*, *Juniperus*). In close link with this supposition a stronger microlithic process of lithic pieces comes. The very small number of palaeofauna remains is to be remarked.

References

Al. Păunescu, Gh. M. Vasiliu, *Noi descoperiri paleolitice în regiunea Suceava*, in *Revista Muzeelor*, IV, 1967, 4, pp. 364—366 ; Al. Păunescu, *O nouă aşezare gravettian—orientală în nordul Moldovei*, in *SCIVA*, 19, 1968, 1, pp. 31—39 ; idem, *Evoluţia uneltelor şi armelor de piatră cioplită descoperite pe teritoriul României*, Bucureşti, 1970, pp. 132—133 ; Al. Păunescu, P. Şadurschi, V. Chirica, *Repertoriul arheologic al judeţului Botoşani*, Bucureşti, 1976, pp. 250—251 ; M. Cărciumaru, *Mediul geografic în pleistocenul superior şi culturile paleolitice din România*, Bucureşti, 1980, pp. 203—205.

11. UDEŞTI, COMMUNE OF UDEŞTI, DISTRICT OF SUCEAVA POIANA UDEŞTI

History of Research

This Paleolithic settlement was discovered in 1970 during a surface survey by M. Bitiri. Systematic excavations were made between 1970 and 1972.

This site lies—like the one at Dorohoi-Strachina (which see) — on a plateau segmented into step-like features. The surface has been subjected to both ploughing and intense erosion and slopewash.

Geological Stratigraphy

- 0.00—0.10 m, dusty, grey—yellowish soil ;
- 0.10—0.45 m, yellowish clay soil ;
- 0.45—1.10 m, brown—grey soil with prismatic detachments ;
- 1.10—1.50 m, yellow clay soil with grey intercalations ;
- 1.50—2.50 m, sand and clay soils intergrading with basal alluvial deposits.

Archeological Stratigraphy

Only one cultural layer was discovered. It was about 0.50 m deep, at the limit between the brown-grey and dusty yellowish soils.

Cultural Features

The presence of former hearths is attested by isolated pieces of charcoal and by some calcined silex pieces. Workshops are represented by scatters of lithic materials and debitage. Decortication blades, flakes and other items in various stages of processing were found. Either Buglovian Prut silex or Carpathian rocks were used as raw materials.

Palaeofaunal remains are completely absent. This is typical for many sites belonging to the last stages of the Gravettian, that is between the end of the Pleistocene and Holocene.

Lithic Assemblages

Both in the culture stratum and at the present-day surface, some 3,323 lithic pieces were found: 951 (28.62%) typical and 2,372 (71.38%) flakes and atypical fragments, some of them decortication processes.

Among the 951 typical ones, 290 tools were encountered belonging to the following types:

— end scrapers worked on flakes and fragmentary blades, some of them double, with their active side convex, or on blades with obliquely retouched sides	79...27.21 %
— microlithic "à bord abattu" blades	55...19 %
— burins on blades and flakes, on oblique or concave retouched truncations (21), angle on a break, straight dihedral and on wide flakes, each of them with a wide, retouched notch	45...15.52 %
— burin blow type blades and bladelets	16... 5.18 %
— perçoirs on thin blades	6... 2.07 %
— Gravette points	6... 2.07 %
— totally or partly backed blades	3... 1.03 %
— end scraper-burins	8... 2.77 %
— burin-perçoirs	2... 0.68 %
— blades with retouched truncations	15... 5.17 %
— blades and flakes with notches	22... 7.59 %
— finely retouched blades and flakes	47...16.21 %
— écailée piece	1... 0.34 %
— piece of shouldered point type	1... 0.34 %

To these are to be added a few large and middle prismatic and pyramidal nuclei, similar to the entire inventory.

The composition of raw material is interesting: Prut silex (76.01%), rocks of Carpathian origin (menilite and black shales called Audia) (16.11%), gritstones considered by the researcher to be of local origin (7.15%), as well as a piece of black, translucent obsidian.

Conclusions

Similar to habitation levels at Cotu-Miculinți or Stîncea-Ripiceni, the Poiana Udești site has two technical-typological series. An archaic component includes some scrapers which resemble rabbits. Pieces specific to the late Gravettian include some with microlithic characteristics. The "shouldered point", although atypical, is also late. The obsidian is very unusual.

The character, duration in time and age of this habitation, especially in the eroded stratigraphic conditions it was found cannot make for many wide reaching conclusions. The lack of palynological radiocarbon analyses cannot be put forward since the site's eroded condition. In this sense, the esta-

ishment of this settlement within the geochronological Gravettian scheme in the Eastern-Carpathian region is difficult to make.

Considering the single atypical piece, it is difficult to support the idea that this site could have belonged to the Kostienki-Avdeevo Gravettian cultural group. In our estimation, the C-14 dates of the eponymic sites ($22,300 \pm 300$ B.P. and $22,400 \pm 600$ B.P.) appear too early. We rather estimate that the habitation at Poiana Udești developed late in the Tardiglacial period, after the first episodes marked by the pine-phase, and could be synchronic with the period between Dryas I and Bölling climatic oscillations.

References

M. Bitiri, *Așezarea paleolitică de la Udești și specificul ei cultural*, in *SCIVA*, 32, 1981, 3, pp. 331—345.

12. DOLHASCA, COMMUNE OF DOLHASCA, DISTRICT OF SUCEAVA DEALUL VIEI

History of Research

This Paleolithic site was discovered in 1967 by Prof. M. Tanasache who also carried out the first archeological surface survey during which many silex and other rocky pieces were found.

In 1976, V. Chirica and M. Tanasache carried out a stratigraphical sondage and they identified a culture layer.

The site is situated on the north-eastern slope of Dealul Viei. It has also suffered from serious ground displacement and slope wash typical for almost all the Plateau of Suceava. On this subunit of the Moldavian Plateau, on the foreheads of erosion-levels and on the higher terraces, the slope erosion leads to frequent sliding processes, due to the captive Sarmatian water sheets and ground-water layers at the base of Quaternary agglomeration reliefs.

Geological Stratigraphy

- light-yellow 0.24 m thick soil representing the present-day surface ;
- brown-reddish soil, not thicker than 0.20 m ;
- yellow-reddish 0.17 m thick soil ;
- yellow, a little reddish soil, 0.10 m thick ;
- yellow soil, lighter in the lower part and a little darker at the top, 0.27 m thick ;
- light yellow, 0.40 m thick soil with fine sand lenses, wider in the lower part and thinner in the upper one.

Erosional processes have destroyed the upper vegetal soil (chernozem), bringing older sediments to the surface.

Archeological Stratigraphy

Only one Gravettian level has been identified. It is situated in the yellow-reddish soil as well as in the lower one, at a depth of 0.65—0.80 m. Taking into account the large amount of archeological material gathered in

previous survey years from the site's surface, one cannot exclude the existence of an initial Gravettian cultural level. It may have been destroyed by cryoturbation and gelivation processes on this abruptly sloping ground. There are no typological differences between lithic tools gathered on the soil surface and those discovered by digging. No „à bord abattu“ blades were found in the above stratigraphic unit. Perhaps this was caused by the limited character of excavations.

Habitation complexes are absent, although some silex pieces show various degrees of calcination, and in the culture layer. Isolated pieces of charcoal indicate the earlier presence of hearths. Faunal remains are also absent.

Lithic Assemblages

Only 14 % pieces were typical tools. The assemblage (84 %) was comprised of debitage and nuclei. This demonstrates the existence of certain lithic workshops for silex production and other rocks of Carpathian origin.

The following tools and their percentages can be distinguished :

— end scrapers : simple, with their active side convex (34), active side oblique (3) ; oval (1), carinated (4), unguiform (2), fanshaped (5), nosed (5) (3 on retouched blades), double (1) and unfinished ones (2)	57—33.54 %
— burins : double (3), angle on a break (12), angle on retouched straight truncated blade (1), retouched oblique truncation (4), retouched concave truncation (3), middle ones (5)	28—16.47 %
— rabot on nucleus fragment	1— 0.60 %
— end scraper-burin on middle blade	1— 0.60 %
— „à bord abattu“ bladelets	16— 9.42 %
— „à bord abattu“ blades	6— 3.53 %
— retouched blades, one with its left margin obliquely arched and retouched	39—22.94 %
— notched blades	5— 2.94 %
— perçoirs	11— 6.47 %
— perçoir-burin	1— 0.60 %
— bifacial pieces	3— 1.77 %
— segment-shaped pieces	2— 1.12 %
— denticulate blade	1— 0.60 %
— crested blades	40
— unretouched or retouched blades, some decortication pieces : 9 macrolithic, 478 middle, 508 microlithic ones, most of them fragmentary	995
— unretouched flakes	15
— unretouched or retouched lamellar flakes	84
— nuclei with one or two platforms, some of them exhausted, most of them prismatic or pyramidal	61

Of special importance is the diversity of raw material. Thus, from the above mentioned pieces (in the statistical and typological table), 1,070 (78 %) were made of Prut silex with its whole range of shades ; 257 (19 %)

were of gritstone of different solidity and granulation ; 25 (1.82%) were of menilite and 13 (0.95%) of black Audia shale. Other than these, there was only one piece of yellow-brownish silex, resembling that from the Prebalkan Platform formation, another of a Dniestr silex and one of marl. This diversity can also give an explanation for that at Poiana Udești, as the specialised research specifies that all terraces on Suceava Plateau are made of alluvial deposits rich in gravels and blocks. These form the base for accumulating reliefs and are also to be found on the hills of higher depressions or on the plateaux unaffected by interriver erosion.

Conclusions

If the archeological stratigraphy is correct in the sense that only one habitation level was found subsurface then the pieces on the soil surface may have come from an upper part of the slope. Erosion phenomena there is more intensive and active.

If this is the case, we may talk of the existence of a longterm settlement but which does not correspond to the restricted and seasonal character of the last Gravettian phase. On the other hand, the existence of a possible rather recent culture level should have been noticed during stratigraphic sondages, thanks to some silex pieces in one of the upper strata somehow identical to geological levels in which there are traces of Gravettian habitation (Poiana Udești, Dorohoi-Strachina and Topile-Dealul Catargii). Taking into account only one habitation level, it might have been contemporary with the settlements at Mitoc-Malul Galben, dated to $20,945 \pm 850$ B.P. (GX-8503) and $20,300 \pm 700$ B.P. (GrN-14031) that is towards the end of Würm III stade, possibly during Laugerie, in parallel with Herculane II climatic oscillations in the geochronological scheme of Romanian Gravettian.

References

V. Chirica, M. Tanasache, *Cercetări arheologice în așezarea de la Dolhasca (jud. Suceava) și unele considerații privind Gravettianul de pe teritoriul României*, in *Memoria Antiquitatis*, VI—VIII (1971—1976), Piatra Neamț, 1981, pp. 267—290.

13. TOPILE. COMMUNE OF VALEA SEACĂ, DISTRICT OF IAȘI DEALUL CATARGII

History of Research

The settlement at Dealul Catargii (like those at Dealul Stoicii and Dealul Sârjaca) was discovered by Prof. V. Mihalache. He made the first surface investigations between 1966 and 1968. In 1969, Al. Păunescu carried out systematic excavations in three places on Dealul Catargii and in one place on Dealul Stoicii.

All these settlements lie in the southern part of the Suceava Plateau, on small plateaux with relative altitude of 590—610 m.

Geological Stratigraphy

The following soils were identified :

- A₁A₂ type soil, medium light grey clay, 0.00—0.08 m thick ;
- A₂ type soil, whitish-grey medium clay, 0.08—0.28 m thick ;
- AB type soil, yellowish-brown heavy clay, with whitish-grey spots, 0.28—0.40 m thick ;
- B₁ type soil, heavy loam — light clay of reddish-brown colour, with grey spots, 0.40—0.50 m thick, ;
- B₂ type soil, heavy loam — light clay of dark-reddish colour.

Plateaux and slopes were subjected to erosion processes. That is why the culture stratum is very close to the present-day soil.

Archeological Stratigraphy

Only one habitation level was identified. It is situated in A₂ and AB soils. Isolated lithic pieces were found in the other horizons, too.

Habitation Complexes

In the central and northern part of the settlement two habitation surfaces were identified. A great number of oval-shaped lithic pieces were found. The diameters of habitation surfaces were of about 7.50 × 6.00 m and 12.00 × 7.00 m. The second habitation surface is situated about 70 m north of the first one. In our opinion, there might be some other habitations of this type within the area of about 25,000 sq. m of the entire zone. No hearths were found, but some silex pieces are calcined. Traces of intense erosion.

Palaeofaunal remains are completely missing. Al. Păunescu attributes this to the soil acidity and to the medium-size mammals hunted by this Gravettian community.

Lithic Assemblages

Typical pieces amount to only 12% of the entire lithic inventory (similar to the situation encountered at Dolhasca-Dealul Viei). The following types of tools were identified :

- end scrapers on blades (31) and flakes (28), of which 12 on retouched blades : convex (most of them), ogival (1), unguiform (1), oval (1), „shouldered“ (1), nosed (2), high (3), triangular with retouched sided (5), double ones (7) 59—44.69 %
- burins : angle on a break (3), oblique retouched truncation (2), straight retouched truncation (2), concave retouched truncation (1), curved dihedral (3), straight dihedral (1), transverse (1), nucleiform (1), mixed multiple ones (1) 15—11.36 %
- end scraper-burins 2— 1.52 %
- perçoirs on blade 1— 0.76 %
- totally or partly retouched blades 12— 9.09 %
- “à bord abattu“ bladelets, of which 4 with fine retouch on the second side 18—13.63 %

— „à bord abattu“ bladelets with retouched truncations	2 — 1.52 %
— „à bord abattu“ bladelet with double oblique retouched truncation	1 — 0.76 %
— Gravette points, of which 5 with fine retouch on the flat side	8 — 6.06 %
— blade with oblique retouched truncation	1 — 0.76 %
— finely denticulate pieces	5 — 3.78 %
— notches	2 — 1.52 %
— double sidescrapers	2 — 1.52 %
— unretouched blades	468
— flakes and lamellar flakes with carving retouch . . .	8
— nuclei with one or two blowing sides : prismatic (10), quasi-conic (4), irregular ones (21)	35

To these, we can add those found by V. Mihalache : 17 end scrapers, 1 „à bord abattu“ blade, 3 burins, 2 finely denticulate blades, 2 retouched blades, 9 nuclei, 68 unretouched blades and 4 flakes with fine carving retouch.

The raw material used is rather diversified : Middle Prut Buglovian silex (82.56 %), menilite (9.90 %), silicified glauconitic gritstone (3.86 %), black schist Audia (3.68 %). Microlithic pieces amounted to 77.50 %, the medium-size pieces to 20 % and the macrolithic ones to only 2.50 %.

Conclusions

The great quantity of end scrapers, followed by burins and the percentages of the other tools make this habitation surface look very much like that at Dolhasca—Dealul Viei.

The other two settlements at Valea Seacă have supplied few lithic tools but they are similar qualitatively. Their almost identical stratigraphic position and the already mentioned features give them a certain unity. We think they are about contemporary.

The settlement on Dealul Catargii was attributed to a final Gravettian stage. On the basis of pollen analyses it was dated to the last Würm stade or before the transitional period between Pleistocene and Holocene. Associations of *Pinus*, *Betula*, *Salix*, *Picea* were found beside thermophile plants (*Tilia*, *Ulmus*, *Carpinus*). We think that the habitation surface at Dealul Catargii belongs to Laugerie or Lascaux climatic oscillations, paralleled with Herculane II or eventually Românești ones (according to geochronological scheme established by M. Cărciumaru for the Upper Pleistocene in Romania).

References

- V. Mihalache, *Cercetări arheologice de teren în comuna Valea Seacă, jud. Iași*, in *SCIVA*, 21, 1970, 3, pp. 465—468 ; Al. Păunescu, *Locuiri gravettienne de la Valea Seacă (jud. Iași) și unele considerații asupra Gravettianului oriental final din Moldova*, in *SCIVA*, 21, 1970, 4, pp. 539—549 ; M. Cărciumaru, *Analiza polenică a sedimentelor din așezarea gravettian-orientală de la Topile — „Dealul Catargii” (com. Valea Seacă, jud. Iași)*, in *SCIVA*, 21, 1970, 4, pp. 551—554 ; idem *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 205—207.

14. MOVILENI, COMMUNE OF HELEȘTENI, DISTRICT OF IAȘI IN RĂZĂȘIE

History of Research

This Gravettian habitation level was discovered in 1953 by Prof. N. N. Zaharia during a surface archeological survey throughout Moldavia. In 1960, Al. Păunescu carried out a check sondage in this place located between the Suceava Plateau and the Central Moldavian Plateau.

Geological and Archeological Stratigraphy

The author of researches noticed a whitish-yellowish layer directly under the vegetal soil. It was superposed over the brown-reddish soil (0.40—0.46 m thick) where the habitation level was found.

On the quite small area under discussion (only 16 sq.m) no habitation complexes or palaeofaunal remains were identified. Possible lithic workshops were indicated by a great quantity of debitage.

Lithic Assemblages

A number of 343 lithic pieces were found. 54% of them were atypical pieces :

— convex end scrapers (2 nucleiform ones)	4.20%
— „à bord abattu“ blades and Gravette points	14.20%
— perçoirs	0.60%
— burins on microlithic blades	0.60%
— denticulate pieces	0.60%
— obliquely truncated and abruptly retouched blades . . .	0.60%
— blades and lamellar flakes, unretouched or with fine carving retouch	78.00%
— prismatic or quasi-conic nuclei	2.40%

Raw material is as varied as in other levels on the Suceava Plateau : menilite (51%), Prut silex (23%), silicified glauconitic gritstone (16%), Black shale Audia (10%). Most of the pieces are medium-size (44%), followed by microlithic (42%) and macrolithic ones (14%).

Conclusions

The author of researches placed this habitation level in a final stage of Moldavian Gravettian. The lithic material found did not permit a more accurate dating. The absence of habitation complexes, hearths and faunal remains leads to the same conclusion. Some aspects could be discussed, however, in connection with raw materials. The Suceava Plateau is the only region where so many kinds of rocks were used to make tools (except for habitation levels on Bistrița River terraces). The presence of Carpathian rocks in greater quantity than Prut silex would mean that this habitation level was a temporary one. The absence of habitation traces, a specific feature for all levels in Final Gravettian, could suggest that this level belongs to a post-glacial climatic oscillation or to a transition stade between Pleistocene and Holocene.

N. N. Zaharia, *Descoperiri paleolitice în Moldova efectuate între anii 1952 și 1977*, in *Arh. Mold.*, I, 1961, p. 32; Al. Păunescu, *Cercetări paleolitice*, in *SCI VA*, 17, 1966, 2, pp. 327—329; V. Chirica, M. Tanasache, *Repertoriul arheologic al județului Iași*, vol. I, Iași, 1984, p. 169.

15. BISTRICIOARA, COMMUNE OF CEHLĂU, DISTRICT OF NEAMȚ LUTĂRIE

History of Research (for all the sites in the Ceahlău area)

Paleolithic settlements in the Ceahlău area were discovered and investigated since 1955 on the occasion of the raising of Bicaz dam. Archeological investigations continued until 1958, being led by C. S. Nicolăescu-Plopșor, with the participation of Al. Păunescu, N. N. Zaharia, Tiberiu Bader, I. Stratan M. Bitiri, Doina Ignat, etc. Al. Păunescu resumed the investigations in 1971 together with M. Cărciumaru and V. Chirica. Al. Păunescu carried out other series of investigations in 1980—1981 and 1983—1984.

In the Râpciuni basin, on an area of 3 km long and 0.5—3.0 km wide 16 Paleolithic sites were identified. They comprised 39 habitation levels belonging to Aurignacian (9) and Gravettian (30).

The settlements are situated on the Bistrița River terraces. Most of them lie on the middle 40 m terraces, at an altitude of about 550 m. on the right side of the river. The Bistrița terraces are sometimes very wide. During the Upper Pleistocene they offered human communities extremely favourable ecological conditions.

Geological Stratigraphy

During the investigations between 1956 and 1958 several geologic levels were identified at Bistricioara-Lutărie (Clay Pit):

- black vegetal soil, 0.10—0.15 m thick;
- fine yellowish soil, up to 0.40 m thick;
- brown-reddish fossil soil, 0.10—0.40 m thick;
- red-yellowish loess, 0.25—0.80 m thick;
- grey, “pseudo-micellian” loess, 0.50—1.00 m thick;
- grey-reddish soil, 0.20—0.40 m thick;
- the gravel of the terrace.

It was initially considered that the brown-reddish soil belonged to Würm II—III interstades and the yellowish one to the last glacial stade. These superposed soils were found at a depth of about 1.10—1.90 m. According to the granulometric, chemical and palynological analyses made between 1971 and 1972, the reddish—brown deposit belongs to the last glacial stade and the yellowish sediment to Tardiglacial. The reddish-brown level was found to be intensely affected by periglacial phenomena, especially by those at the end of the last glacial stade. In present-day investigations the reddish-grey horizon at the base of the profile is considered to be stratigraphically situated over the terrace gravel and to belong to the W_2 glacial stade. The sandy-clayey soil between about 2.80—0.70 m containing slight accumulations of $CaCO_3$ was deposited in conditions of an interstadial climate, that

is during Ohaba (A+B) climatic oscillation. The lower part of the yellowish, clayey loess was deposited during the last glacial stage and its upper part in Tardiglacial.

Archaeological Stratigraphy

Six habitation levels (Middle Aurignacian, Upper Aurignacian, Lower, Middle, Upper and Final Gravettian) were found during the survey between 1956 and 1958. The following stratigraphic sequences were identified :

— level I belongs to the Middle Aurignacian ; 0.10–0.20 m thick ; rich in hearths, calcination traces and lithic tools. It is situated at the lower part of the 0.50–1.00 m thick yellow sediment specific to the second glacial stage at the beginning of Ohaba A climatic oscillation. Through radiocarbon analyses it was dated to $24,100 \pm 1,300$ (GrN-10529), $24,760 \pm 170$ (GrN-11586), $27,350^{+2,100}_{-1,500}$ (GX-8844) and $23,560^{+1,150}_{-980}$ (GX-8845-G) ;

— level II, considered as belonging to Upper Aurignacian, is situated at the upper part of the grey sediment ; 0.30–0.35 m thick ; very rich in habitation complexes and faunal remains. It was dated to the Ohaba A climatic oscillation of Ohaba interstadial complex. Later, Al. Păunescu attributed this level to a first stage of Gravettian habitation dated through C-14 to $20,300 \pm 1,300$ (GX-8725) and $23,450^{+2,000}_{-1,450}$ (GX-8727-G) ;

— level III had been attributed to Lower Gravettian ; in 1984, it was attributed to Middle Gravettian ; 0.15–0.20 m thick ; hearths, calcination traces and lithic tools were found. It was attributed to the Ohaba B climatic oscillation of the Ohaba interstadial complex. It is situated in the 0.25–0.80 m thick yellowish-reddish sediment. C-14 analyses dated it to the period between $20,995 \pm 875$ (GX-8729) and $18,000 \pm 1,200$ (GX-8728) ;

— level IV is now considered to belong to an evolved Gravettian stage ; it was dated to $16,150 \pm 350$ (GrN-10528) and $19,055 \pm 925$ (GX-8730). It is 0.10–0.16 m thick. It is situated in the same yellowish-reddish sediment ; rich faunal remains and lithic tools. It is attributed to Ohaba B climatic oscillation ;

— level V is attributed to Upper Gravettian ; it is situated at the upper part of the yellowish-reddish sediment ; 0.15–0.25 m thick ; traces of habitation facilities, lithic tools and faunal remains were found. It was dated to the final period of Ohaba B climatic oscillation ;

— level VI (Final Gravettian) is separated from level V by a sterile, 0.10–0.35 m thick reddish-brown deposit dating from Würm 3 glacial stage. It is situated in a 0.15–0.40 m thick dusty-yellowish sediment ; relatively rich in lithic tools. It was attributed to Tardiglacial.

Habitation Complexes

In levels II–V hearths with some habitation characteristics were found. Hearths in level II are either lined with stones or surrounded by gritstone slabs. One of these has about 9 sq. m and contained five 0.10–0.20 m wide hollows deepened down to 0.25 m ; many gritstone slabs were scattered all over the area. At a short distance, south from it, an oval area of about 7.50 sq. m, with a NW–SE orientation, was characterized by burnt and hardened soil ; it might be another seasonal habitation surface.

Proper hearths cover areas of about 1.10—1.50 sq. m. and are of the deepened or surface types. Calcined slabs, bone remains and lithic pieces were found.

In level III, hearths are smaller and poorer. Calcined traces point out to some geological processes that destroyed the surface hearths in levels I—IV. A group of three hearths, the hardened hollows in the soil and calcined gritstone slabs in level V might indicate a habitation surface of greater dimensions.

Lithic workshops here don't have the features of those in the Middle Prut area or in other settlements on the Moldavian Plateau. The presence of debitage (flakes and unfinished blades) — silex and local rocks — shows that tools were worked within the settlement area. Prut silex pieces seem to have been brought in a half-processed stage. They are to be found in all the six Gravettian levels but are different from those in the neighbouring areas where finished pieces represent 1—5% of the total amount of debitage. At Bistricioara-Lutărie, only in level II the proportion of the two categories lithic pieces is 1/10; the relation is even smaller in other levels: 1/4 or 1/3.

Palaeofauna]

Faunal remains were found in levels IV—V but their state of preservation does not permit identification of species. Teeth remains are in better condition; they belong to some herbivorous animals: *Equus caballus* (levels II—IV), *Bos s. Bison* (levels II—III) and *Rangifer tarandus* (level III). Some bone fragments were found within hearths perimeter but too poorly preserved to allow any considerations concerning food preparation in those times.

Lithic Assemblages

Level II contains only 42 typical pieces and over 400 debitage materials; flakes and blades, some of them intact, most of them unretouched or with utilization retouch. Single and double end scrapers, most of them convex, dihedral, angle and double burins were also found.

Level III is the richest at Bistricioara-Lutărie. The following tools were identified:

— retouched blades	9—10.97 %
— „à bord abattu“ blades	5— 6.09 %
— Gravette points	1— 1.22 %
— end scrapers on flakes or blades, with convex active side and of high type on nucleus	44—53.66 %
— sidescraper on flake	1— 1.22 %
— dejeté dihedral, angle on abreak, retouched oblique truncation, multiple burins	18—21.26 %
— burin-end scraper	1— 1.22 %
— perçoirs on flakes	2— 2.44 %
— blade with retouched oblique truncation	1— 1.22 %

To these other about 200 unretouched blades, lamellar unretouched flakes, prismatic and pyramidal nuclei must be added.

Level IV contains almost the same types of pieces in a smaller quantity. The following Gravettian tools have the largest share :

— retouched blades	12 — 6.50 %
— „à bord abattu“ blades	6 — 3.00 %
— Gravette points	2 — 1.00 %
— end scrapers on blades and flakes, most of them convex, 1 nosed, 3 of the high type and 2 with its active side concave	29 — 11.00 %
— angle, dihedral, double burins	17 — 7.00 %
— burin-end scraper	1 — 0.50 %

A large amount of unretouched blades (50 %), unretouched blades and lamellar flakes (18 %), nuclei, some of them conical (3 %) were also found.

Level V, besides 162 unretouched blades, contains 20 flakes, some of them unretouched, lamellar, pyramidal and 4 prismatic nuclei and a quantity of varied finished tools :

— retouched blades	16 — 22.53 %
— „à bord abattu“ blades	10 — 14.09 %
— Gravette points	5 — 7.04 %
— blades with retouched or denticulate oblique truncation	3 — 4.23 %
— end scrapers on flakes and blades (some of them retouched) with their active side convex and of the high type only	20 — 28.17 %
— angle on a break, on retouched oblique or concave truncation, dihedral, déjeté or multiple burins	15 — 21.12 %
— burin-end scrapers	2 — 2.82 %

Level VI contains, besides 217 blades and several nuclei, the following types of tools : 6 „à bord abattu“ blades, 2 Gravette points, 2 retouched and obliquely truncated blades, 2 denticulate blades, 1 points with its side obliquely sharpened and abruptly retouched, 1 atypical shouldered point, 1 perçoir, 26 end scrapers on flakes and blades, most of them convex but also straight, oblique, of the high type, nosed and shouldered ones, 14 dihedral burins, on oblique and concave truncation, retouched and multiple ones, 1 burin-end scraper.

Raw material is quite diversified, Prut silex alternates with local and Carpathian rocks. Level II contains black schist Audia (38 %), Prut silex (31 %), melinite and other rocks (16 %). Level III contains Prut silex (55 %), melinite (25 %), black schist Audia (13 %), silicified gritstone (7 %). Level IV contains Prut silex (62 %), melinite (30 %), black schist Audia (6 %), silicified gritstone (2 %). Level V contains melinite (56 %), Prut silex (36 %), black schist Audia (7 %), silicified glauconitic gritstone (1 %). The same rocks and percentages are to be found in level VI.

The medium-size pieces have the largest share in all levels, followed by microlithic and macrolithic ones in various proportions :

— level	II : 83 %	13 %	4 %
— level	III : 82 %	14 %	4 %
— level	IV : 74 %	23 %	3 %
— level	V : 72 %	25 %	3 %
— level	VI : 72 %	18 %	10 %

Bone Tools

Given the large number of end scrapers and burins, we ought to have found many bone or antler pieces. Their absence must be due to either the action of fire or to soil acidity.



Other Discoveries

We may include here the fragment of haematite found in an advanced decaying state.

Conclusions

The Gravettian settlements in the Ceahlău area are of an utmost importance. From 1966, when an ample monographic study was published, on, all the other Gravettian discoveries are related to geological and archeological stratigraphy at Bistricioara-Lutărie and Dirțu-Ceahlău. The lack of grounds of this strict delimitation and the need for a new classification of Romanian Gravettian will be detailed in the two closing chapters of this study. Anyway, some stratigraphic-cultural modifications have been found out, determined by the evolution of research. Thus, the term of „Pre-Gravettian Aurignacian“ was rejected in 1977, but in 1984 level II was placed in „Lower Gravettian“ which led to the change of names for the upper levels, though these had no striking cultural differences in lithic assemblages. Also, if the datings suggested by M. Cărciumaru in 1977 were with correct at that time, with level II placed in Lower Gravettian, this one no longer corresponds to the Ohaba A climatic oscillation. This oscillation, paralleled with Archy, is dated to over 30,000 B.P., while C-14 analyses dated this level to a period comprised between $23,450 \pm 2,000$ B.P. and $20,300 \pm 1,300$ B.P.

As regards fauna, the quasi-total absence of bone remains (except for the teeth ones) is quite striking. The presence of reindeer only in level III (placed in a periglacial stade) shows some discrepancy between the chronostratigraphy of the settlement and the geochronology of its levels, on one hand, and the real stages of Gravettian habitation, on the other one.

The first Gravettian habitation level at Bistricioara-Lutărie (level II) might belong to a later stage since the first Gravettian period in Romania (Lower or Early Gravettian) is dated to about 27,000 B.P. Level II at Bistricioara-Lutărie, immediately anterior to the last glacial stade („Maximum Valdař“), ought to be paralleled with Herculane I — Tursac climatic oscillation (cf. Abri du Facteur, B₁, Molodova V, 7, Solutr , Paglicci (cave), 21 a—c, etc.). Level III is dated through radiocarbon to the „Maximum Valdař“ stade, i.e. to a proper glacial stade (W rm 3), an almost unique situation, in European Eastern-Central zones. But there might exist two real habitation stages, undistinguishable stratigraphically and typologically. They may be dated to the beginning and the end of the last glacial stade.

In our opinion, not even level IV seems to correspond any longer to its present-day dating, even if the term used in the latest systematization is very vague. The existence of an evolved Gravettian in its final stage (level V) could be admitted in $16,150 \pm 350$ B.P. In this case, the last level (VI) should be attributed to an Epigravettian stage in the final period of Tardiglacial.

C. S. Nicolăescu-Plopșor, M. Petrescu-Dîmbovița, *Principalele rezultate ale cercetărilor de la Bicăz*, in *Materiale*, V, 1959, pp. 45—52; idem, *Șantierul arheologic Bicăz*, in *Materiale*, VI, 1959, pp. 57—63; C. S. Nicolăescu-Plopșor et al., *Șantierul arheologic Bicăz*, in *Materiale*, VII, 1961, pp. 37—41; C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, pp. 5—105; Alexandra Bolomey, *La faune des sites paléolithiques de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 114—116; Al. Păunescu, Emilia Cărciumaru, M. Cărciumaru, P. Vasilescu, *Semnificația cronostratigrafică și paleoclimatică a unor avalize chimice, granulometrice și palinologice în unele așezări paleolitice din bazinul Ceahlăului. Considerații asupra tipului și caracterului așezărilor*, in *SCIVA*, 28, 1977, 2, pp. 167—172; Al. Păunescu, *Evoluția uneltelor și aștelor de piatră cioplită descoperite pe teritoriul României*, București, 1970, pp. 127 sq.; idem, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud european*, in *SCIVA*, 35, 1984, 3, pp. 235—265; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 168—170.

16. CEAHLĂU, commune of CEAHLĂU, DISTRICT OF NEAMȚ BOFU MIC and BOFU MARE

Excavations on this middle terrace of the Bistrița River were made in 1957 and 1958 by Fl. Mogoșanu, I. Stratan and M. Bitiri.

Geological Stratigraphy

- vegetal soil, 0.08—0.10 m thick;
- dusty loess. 0.25—0.35 m thick;
- reddish-brown fossil soil with vertical prismatic detachments, 0.30—0.40 m thick;
- yellowish-reddish loess, 1.20—1.40 m thick;
- dark red soil, 1.10—1.20 m thick;
- red soil, darker and darker to the base, with sand-lens and gravels.

By analogy with the other settlements in the area, the reddish-brown fossil soil, archeologically sterile, is supposed to have been formed during Würm₃ stade. Therefore, superposing or superposed archeological levels belong to Tardiglacial and the interstadial Würm₂, respectively.

Archeological Stratigraphy

Two Gravettian habitation levels were identified in the sediments of this terrace:

- level I, belonging to Middle Gravettian; it is situated in the yellowish-reddish soil; 1.20—1.40 m thick; it superposes a sterile soil 0.30—0.40 m thick;
- level II is attributed to Final Gravettian; it was discovered in a dusty yellowish soil 0.25—0.35 m thick.

Habitation Complexes

A hearth was found in level I. Abundant finished tools and debitage in level II.

Lithic Assemblages

Level I represents a sporadic habitation as only 2 end scrapers and 11 debitage materials were found here. It could have been a kind of shelter for hunters.

Level II is very rich in finished tools :

— retouched blades	33 — 7.86 %
— denticulate blades	7 — 1.66 %
— “burin blow“ blades	16 — 3.81 %
— Gravette points	53 — 12.62 %
— points with arched and retouched side resembling the Azilian type	2 — 0.48 %
— blades with retouched oblique truncation	14 — 3.33 %
— perçoirs on flakes and blades, 1 double	11 — 2.62 %
— end scrapers on flakes (71) and blades (14) with retouch on the long sides, most of them convex ; 13 double ; other types : fan-shaped, unguiform, circularly carinated	166 — 39.52 %
— burin-end scraper	1 — 0.24 %
— angle on a break burins, on oblique or straight retouched truncation, dihedral, nucleus-like, multiple, mixed, déjeté, 1 resembling the „Noailles“ type	28 — 6.67 %
— microlithic atypical shouldered point	1 — 0.24 %
— assymetrical, trapezium-like piece with oblique truncation, with its base retouched, resembling the „Vielle“ type	1 — 0.24 %

To these, 360 retouched blades, of which some crested ones, 20 prismatic nuclei and 1,100 debitage materials must be added.

Raw material in level II consisted of menilite (78%), Prut silex (10%), black schist Audia (6%), silicified glauconitic gritstone (6%).

In the category of “other discoveries“, we include some haematite balls probably used for dying.

Conclusions

The third culture stratum at Bofu Mic raises the same chronology problems in correlation with other habitation levels in the area or in the whole East-Carpathian zone. Among lithic tools there are allogeneous elements from different areas, first of all the presence of Prut silex. Even if its proportion is of only 10%, it was used to make fine pieces — „à bord abattu“ bladelets and Gravette points. From this point of view, the Eastern origin of Final Gravettian might be admitted but without implying areas beyond the cultural assemblages on the Middle Prut. The shouldered piece could indicate an influence of Dniestr area (in case it is not due to hazard). Such pieces were found in other Final Gravettian habitation levels, too. But they are all atypical and show typological and technical features specific to these pieces which make up series in Gravettian habitations on the Dniestr, the Dniepr and the Don. The Azilian type points of Central European tradition seem to have been worked in superior technical conditions. The penetrating ways of such an influence are not known yet.

Due to the lack of interdisciplinary studies, the geochronological position of this habitation level is not easy to establish, either. The last levels at Bistricioara-Lutărie and Dîrțu were placed at the beginning of Tardiglacial, possibly during Herculane II (Laugerie) and Românești (Lascaux) climatic oscillations. It would mean the Final Gravettian at Bofu Mic might be dated to the 16-th—13-th milleniums B.P.

The settlement of Bofu Mare is situated on the confluence terrace of the Bistrița River and the Schit rivulet. It lies not far from Bofu Mic and has almost the same geological stratigraphy. A single habitation level was identified. It belongs to the same dusty-yellowish sediment dated to Final Gravettian.

It is a sporadic settlement with no habitation complexes (shelters, hearths, lithic workshops) or faunal remains. Only 8 unretouched blades, 8 unretouched flakes, 2 end scrapers and 1 dihedral burin were found. All this could be explained through the less favourable environmental conditions at the beginning of Tardiglacial, when climate was still very cold.

As for both settlements being placed in Final Gravettian, the total absence of faunal remains belonging to the big herbivorous animals and especially to reindeer is quite striking. The whole Final Gravettian on the Bistrița terraces in the Ceahlău area could belong to a subsequent period, maybe Dryas I (about 16.000 B.P.) when the Epigravettians of the end of Paleolithic period began to show up.

References

C. S. Nicolăescu-Plopșor, M. Petrescu-Dimbovița, *Principalele rezultate ale cercetărilor de la Bicăz*, in *Materiale*, V, 1959, pp. 45—52; idem, *Șantierul arheologic Bicăz*, in *Materiale*, VI, 1959, pp. 57—63; C. S. Nicolăescu-Plopșor et al., *Șantierul arheologic Bicăz*, in *Materiale*, VII, 1961, pp. 37—41; C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 5—105; Al. Păunescu, *Evoluția uneltelor și armelor de piatră descoperite pe teritoriul României*, București, 1970, pp. 134—135.

17. CEHLĂU, COMMUNE OF CEHLĂU, DISTRICT OF NEAMȚ DÎRȚU

This archeological station is situated on the 40 m terrace of the Bistrița River, at an absolute altitude of 550. Investigations were made here between 1955 and 1956 by C.S. Nicolăescu-Plopșor, M. Petrescu-Dimbovița, N. N. Zaharia, Alexandra Bolomey, M. Brudiu, V. Căpitanu, I. Pop. Excavations were made by Al. Păunescu, M. Cărciumaru and V. Chirica in 1971, and by Al. Păunescu in 1980—1983.

Geological Stratigraphy

- grey-black vegetal soil, 0.10—0.50 m thick;
- fine yellow loess, 0.10—0.40 m thick;
- reddish-brown fossil soil, 0.30—0.40 m thick;
- yellowish-reddish loess, 0.30—1.70 m thick;
- grey loess (pseudo-micellian), 0.40—0.80 m thick;
- reddish-grey soil, 0.05—0.25 m thick;

— alluvia at the base made up of mixture of gravel and sand ; some deposits don't cover the whole terrace but only some sectors.

The 1971 investigations meant to take soil samples for granulometric, chemical and palynological tests led to the following stratigraphy :

— between 2.50—2.15 m, over the terrace gravel, a reddish-grey deposit with coarse-grained sand at the base and finer texture at the upper part was found ; initially, it was attributed to W_{1-2} interstade, subsequently to the second glacial stade ;

— between 2.15—1.60 m, a grey deposit with clayey-sandy texture was found ; it was considered to be of "pseudo-micellian" nature ; initially attributed to a glacial stade (W_2), then to W_{2-3} interstade, that is to Ohaba (Ohaba A) interstadial complex ;

— between 1.60—1.40 m, a yellowish-reddish sediment, with a clayey-sandy texture was found ; no carbonates ; attributed to the final Ohaba A and to the whole Ohaba B climatic oscillations ;

— between 1.40—1.00 m, a reddish-brown layer was found ; it was attributed to W_2 glacial stade and not to an interstadial period as it had been established during the 1955—1956 investigations ;

— between 1.00—0.60 m, a yellowish deposit with fine dusty aspect was found ; attributed to Tardiglacial, immediately after the retreat of the glacial cap ;

— the following, dark-grey, post-Paleolithic deposit belongs to Holocene.

Archeological Stratigraphy

Both the 1955—1956 investigations and those in 1971 established the existence of two Middle Aurignacian habitation levels. They are situated in the grey layer superposing the grey-reddish sediment over the terrace gravel. Both habitation levels developed during the second glacial stade and the Ohaba A climatic oscillation. The first level was dated to $25,450^{+4,450}_{-2,850}$ B.P. (GX-9415).

Two Middle and Upper Gravettian levels (III—IV) were found later. They are situated in the yellowish-reddish sediment. Palynologic tests attributed this sediment to the end of Ohaba A and the whole Ohaba B climatic oscillations.

A Final Gravettian habitation level (V) in a dusty-yellowish deposit, after a sterile layer. It belongs to Tardiglacial.

Habitation complexes are missing, although lithic pieces were found in level V. Traces of calcination. Very few faunal remains whose preservation state doesn't allow identification of species. Only *Bos s. Bison* remains in both Aurignacian levels were found.

Lithic Assemblages

The first two Gravettian levels represent seasonal habitations.

Level III contains 16 unretouched blades (intact and fragmentary), 2 retouched macrolithic blades (one of which could have been used as a side-scraper), 4 "à bord abattu" blades, 3 convex end scrapers and 345 atypical-debitage pieces.

Level IV contains 6 nuclei (one of which could have been used as a rabot), 13 unretouched blades, 6 „à bord abattu“ blades, 11 Gravette points, 4 blades with oblique retouch, 11 convex end scrapers, 3 burins and 186 debitage materials.

Level V is the richest. Typologically, the following tools were identified :

— retouched blades	56—11.20 %
— „à bord abattu“ blades	144—28.80 %
— Gravette points	56—11.20 %
— truncated and retouched blades	10— 2.00 %
— denticulate blades	4— 0.80 %
— points with an arched and abruptly retouched side resembling the Azilian type	2— 0.40 %
— perçoirs on blades	2— 0.40 %
— end scrapers on flakes and blades (some of them retouched), convex (most of them), straight (8), concave (1), oblique (8), of the high type (5), nosed (3), rectangular completely retouched (2), circular (7), pentagonal (1), unguiform (14), double (32)	200—40 %
— angle on a break burins (6), on retouched truncation (8), straight dihedral and déjeté (7), multiple (5)	25— 4.80 %
— „esquillée („écaillée“) pieces	2— 0.40 %

To these, 600 unretouched blades, 42 unretouched lamellar flakes and 58 prismatic and pyramidal nuclei must be added. The 8,151 debitage pieces give this level the characteristics of a lithic workshop.

Raw material : (level IV) Prut silex (46%), menilite (42%), black schist Audia (11%), white quartzite (1%); (level V) Prut silex (50%), menilite (40%), black schist Audia (9%), silicified glauconitic gritstone (1%).

Conclusions

The presence of levels III and IV in the same geological deposit and the quasiunity of lithic inventory might be elements of the same cultural-chronological sequence. Their dating to Ohaba B climatic oscillation seems to be in disagreement with the absolute chronology of Stillfried climatic oscillation (about 28,000 B.P.) and the features of the lithic inventory.

The proportion of microlithic pieces (48.70%), followed by medium-size (46.20%) and by macrolithic ones (5.10%) in level V might place it in Final Gravettian. It might also be due to the tendency to use up to exhaustion the Prut silex of very good quality. Anyway, as Final Gravettian had a long evolution, level V at Dirțu might be dated to the early stage of Final Gravettian. It might be approximately synchronous to level IV at Bistricioara-Lutărie and to levels V—VIII at Lespezi which belong to an evolved Gravettian.

However, the points with an arched and retouched side resembling the Azilian ones (also identified at Bistricioara-Lutărie, level VI) could date the last Gravettian level at Dirțu to Dryas I climatic episode. In this case, habitations in levels IV and III might belong to Românești-Lascaux climatic oscillation. The first two Gravettian levels contain too few pieces to be geo-chronologically framed.

C. S. Nicolăescu-Plopșor, M. Petrescu-Dimbovița, *Principalele rezultate ale cercetărilor de la Bicăz*, in *Materiale*, V, 1959, pp. 45—52; idem, *Șantierul arheologic Bicăz*, in *Materiale*, VI, 1959, pp. 57—63; C. S. Nicolăescu-Plopșor et al., *Șantierul arheologic de la Bicăz*, in *Materiale*, VII, 1961, pp. 37—41; C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 5—105; Alexandra Bolomey, *La faune des sites paléolithiques de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 114—115; Al. Păunescu, *Evoluția uneltelor și armelor de piatră cioplită descoperite pe teritoriul României*, București, 1980, pp. 130—131; idem, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud-european* in *SCIVA*, 35, 1984, 3, pp. 235—265; Al. Păunescu, Emília Cârciușmaru, M. Cârciușmaru, P. Vasilescu, *Semnificația cronostratigrafică și paleoclimatică a unor analize chimice, granulometrice și palinologice în unele așezări paleolitice din Bazinul Ceahlăului. Considerații asupra tipului și caracterului așezărilor*, in *SCIVA*, 28, 1977, 2, pp. 157—183; M. Cârciușmaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 168—170.

18. CEAHLĂU, COMMUNE OF CEAHLĂU, DISTRICT OF NEAMȚ CETĂȚICA I

Systematic excavations on this terrace of the Bistrița River, at a relative altitude of 60 m, were made by L. Roșu and M. Bitiri in 1957. Al. Păunescu made investigations in 1981 and 1985—1986.

Geological Stratigraphy

- grey-black vegetal soil, 0.25—0.30 m thick;
- dusty-yellow loess, 0.20—0.25 m thick;
- reddish-grey fossil soil, with vertical prismatic detachments, 0.30—0.50 m thick;
- reddish-yellow loess (pseudo-micellian at the base), 1.40—1.50 m thick;
- rolled materials of about 0.30 m;
- basic alluvial deposits (gravel, gritstone, sand).

Under the fossil soil attributed to Würm glacial stade, the reddish-yellow loess contains much CaCO_3 . The horizon containing traces of habitation from Middle Aurignacian at Bistricioara-Lutărie was attributed to Ohaba interstadial complex, anterior to the last glacial stade. At Cetățica I, traces of Middle and Upper Gravettian habitation were identified in this deposit. Therefore, the respective archeological levels should be considered as somewhat contemporary with Middle Aurignacian dated to $24,100 \pm 1,300$ B.P. and $23,560^{+1,150}_{-980}$ B.P.

Archeological Stratigraphy

- level I, attributed to Lower Aurignacian, is situated at a depth of 2.30—2.50 m, in the rolled materials deposit; we consider this deposit as synchronous to the first Aurignacian level at Mitoc-Malul Galben established to date to Hengelo climatic oscillation;
- level II, attributed to Lower Gravettian, is situated at the lower part of the reddish-yellow deposit;
- level III, attributed to Upper Gravettian, was identified at the upper part of the same deposit. There is a slight discrepancy between the

thickness of geological deposit (1.40—1.50 m) and of the two culture strata (0.15—0.25 m and 0.10—0.18 m, respectively). The 1957 investigations established level II to be situated at the upper part of the reddish-yellow loess and level III at its upper limit and at the base of the reddish-grey fossil soil. It means that habitation level belonging to Upper Gravettian continued to be used at the beginning of the glacial stade ;

— level IV is situated at the limit of the grey-reddish fossil soil and in the dusty yellow deposit up to the limit of vegetal soil. It pertains to the settlement being abandoned during the third glacial stade ; human communities came back to this terrace in Final Gravettian (or Epigravettian).

Habitation Complexes

Level II is the only Gravettian habitation level on this terrace showing more than traces of lithic workshops. Many well preserved hearths, made of light materials ; no gritstone slabs. Few debitage waste ; no well delimited lithic workshops ; local rocks and Prut silex were processed on the spot.

No faunal remains, situation specific to all Gravettian habitation levels on the Bistrița terraces in Ceahlău zone.

Lithic Assemblages

— level II contains about 64 typical pieces (blades and unretouched flakes included) and about 400 debitage materials. The following typical pieces were identified :

— nuclei	5— 7.50 %
— blades (some with oblique retouch)	30—47.60 %
— flakes (some retouched)	6—10.00 %
— end scrapers (most of them convex)	13—20.50 %
— „à bord abattu“ blades	4— 6.00 %
— angle on a break burins	3— 4.50 %
— “burin blow“ blades	2— 3.00 %
— point with proximal retouch on both sides	1— 1.50 %
— level III is poorer from lithic point of view. The following tools	

were identified :

— nuclei	2— 4.60 %
— unretouched simple blades	28—65.50 %
— retouched flakes	2— 4.60 %
— blades with oblique retouch	2— 4.60 %
— end scrapers	2— 4.60 %
— burins	2— 4.60 %
— “à bord abattu“ blades	2— 4.60 %
— Gravette points	2— 4.60 %
— “burin blow“ bladelet	1— 2.30 %

To these, about 200 debitage materials must be added.

— level IV contains a smaller number of typical tools :	
— nuclei	1— 3.20 %
— unretouched simple blades	16—48.00 %

— retouched flakes	8—24.00%
— angle or dihedral burins	2— 6.60%
— convex end scrapers	3— 8.00%
— Gravette point	1— 3.20%
— „à bord abattu“ bladelets	3— 8.00%

The most frequently encountered raw material in all three Gravettian levels is Prut silex : 50% in level II, 62.60% in level III and 47.20% in level IV ; menilite (33%), black schist Audia (13%) ; glauconitic gritstone (4% ; level II) ; menilite (27.40%), black schist Audia (5%), glauconitic gritstone (5% ; level III) ; menilite (30.60%), glauconitic gritstone (13.90%), black schist Audia (8.30% ; level IV).

Conclusions

Given the total absence of Prut silex in level I (Lower Aurignacian) and its prevalence in Gravettian culture strata the origin of this culture is to be found within the Middle Prut area.

Levels II and III are situated in the same geological deposit, prior to the last glacial stade. Therefore, they ought to be framed in a single cultural sequence of an evolved Gravettian stage ; the last level may be attributed to Epigravettian, at about the same time as level VI at Bistricioara-Lutărie, level VI at Dîrțu and level II at Bofu Mic.

Geochronologically, the dating of these habitation levels to a period after Românești (Lascaux) climatic oscillation, that is Dryas I. would be nearer to the real time when these human groups inhabited the Bistrița River terraces.

Other settlements with habitation levels initially attributed to Final Gravettian (which may now be placed in Epigravettian) were investigated on the Bistrița terraces in Ceahlău area. They all have a single culture stratum and a seasonal aspect, shelters for hunters :

— Cetățica II, situated on the 25 m terrace ; on a 20 sq. m area, in a dusty-yellowish soil, 5 finished tools and 20 debitage pieces were found ;

— Cetățica III, situated on the 18 m terrace ; habitation level in the same dusty-yellowish sediment ; 6 typical tools and 148 debitage pieces were found ;

— Curtea Bisericii Vechi (Old Church Yard), on the 15 m terrace ; isolated charcoal fragments and only 4 atypical pieces were found in the dusty-yellow soil ;

— Lutărie (Clay Pit), situated on the 40 m terrace within the perimeter of Ceahlău village ; level II attributed to Middle Gravettian ; it is situated in a reddish-yellowish sediment and contains only 3 relatively atypical pieces ;

— Schițor, situated on the 18 m terrace ; on an area of about 200 sq.m only 10 pieces (of which 1 finished) were found in a dusty-yellow sediment ;

— Grințieș-Frasinu I, situated on the 40 m terrace ; level III attributed to Upper Gravettian ; it is situated in the reddish-yellowish soil ; only 2 pieces were found ;

— Grințieș-Frasinu II, situated on the 18 m terrace ; only 2 typical pieces (end scrapers) were found in the dusty-yellowish sediment ;

— Secu-Curtea Boului, situated on the 40 m terrace ; two habitation levels were identified ; first level, attributed to Upper Gravettian (only 14 pieces, of which 13 atypical, were found in the reddish-yellowish sediment) ; second level, attributed to Final Gravettian (6 atypical pieces were found in the dusty-yellowish horizon).

References

C. S. Nicolăescu-Plopșor, M. Petrescu-Dîmbovița, *Principalele rezultate ale cercărilor de la Bicăz*, in *Materiale*, V, 1959, pp. 45—52 ; idem, *Șantierul arheologic Bicăz*, in *Materiale*, V, 1959, pp. 57—63 ; C. S. Nicolăescu-Plopșor et al., *Șantierul arheologic Bicăz*, in *Materiale*, VII, 1961, pp. 37—41 ; C. S. Nicolăescu-Plopșor, Al. Păunescu, F. I. Mogoșanu, *Le paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 63—71 ; Al. Păunescu, Emilia Cărciumaru, M. Cărciumaru, P. Vasilescu, *Semnificația cronostratigrafică și paleoclimatică a unor analize chimice, granulometrice și palinologice în unele așezări paleolitice din Bazinul Ceahlăului. Considerații asupra tipului și caracterului așezărilor*, in *SCIVA*, 28, 1977, 2, pp. 157—183 ; Al. Păunescu, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud-european*, in *SCIVA* 35, 1984, 3, p. 242 ; V. Chirica, *La genèse et l'évolution des cultures du Paléolithique supérieur dans la zone du Prut Moyen d'après les recherches récentes*, in *La genèse et l'évolution des cultures paléolithiques sur le territoire de la Roumanie*, Iași, 1987, pp. 25—40.

19. CEHLĂU, COMMUNE OF CEHLĂU, DISTRICT OF NEAMȚ CREMENIȘ I AND II

Excavations on the 120 m relative altitude terrace, situated near the confluence of the Bistrița and Bistricioara rivers, at the place called Cremenîș I, were carried out by I. Stratan in 1956—1957. Cremenîș II, situated at the base of this terrace, on another middle terrace with a relative altitude of 40 m was investigated in 1956 by the same researcher.

Geological Stratigraphy

- black-grey vegetal soil, 0.08—0.10 m thick ;
- dusty-yellow loess, 0.20—0.25 m thick ;
- brown-reddish fossil soil, 0.30—0.35 m thick.

The latter might belong, as in the case of middle terraces, to Würm₃ glacial stade. In this case, the upper stratum should be framed in Tardiglacial

Archeologically, a single Final Gravettian habitation level was identified. It has a seasonal aspect and was dated to Final Gravettian due to its stratigraphic position rather than to the features of the culture stratum. No elements of habitation or hearths (even burnt spots and calcined silex pieces are missing). No lithic workshops. No faunal remains.

Lithic Assemblages

Only 11 typical tools, 15 unretouched blades and 63 debitage pieces were found. The 11 finished tools comprise 7 end scrapers, 3 burins and 1 Gravette point. End scrapers are on small flakes and blades with their active side convex, except one with its active side oblique. Burins are medium-size and angle on a break. The Gravette point is on a Prut silex microlithic blade.

Raw material : menilite (85 %), black schist Audia (6 %), silicified glauconitic gritstone (5 %) and Prut silex (4 %).

Most pieces are microlithic giving the whole an Epigravettian character.

A 10 sq.m sondage at Cremenîș II resulted in a few Prut silex atypical pieces. They were found at the lower limit of the dusty yellow deposit. This possible habitation level was attributed to Final Gravettian on the basis of this element. In our opinion, it belongs to Epigravettian.

Conclusions

The seasonal character of these settlements don't allow any cultural-chronological hypotheses. All habitation levels attributed to Final Gravettian are, however, situated in the dusty yellow deposit of the Bistrița terraces (Ceahlău area).

Chemical, granulometric and palynological tests gave the following results for this deposit : 50 % fine sand, over 22 % dust and about the same quantity of 0.002 mm fine clay ; it is rich in SiO_2 (64.92 %) and Al_2O_3 (15.70 %). Palynologic tests date this sediment to Tardiglacial without precisising the exact period. At Cremenîș I, these determinations can be completed with the microlithic Epigravettian-like character of tools. Al. Păunescu attributed level VI at Bistricioara-Lutărie to the same cultural sequence and to Dryas I phase. It means that habitation levels at Cremenîș I and II may be dated to 15,000—14,000 B.P., too.

References

C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 71—72 ; Al. Păunescu, Emilia Cărciumaru, M. Cărciumaru, P. Vasilescu, *Semnificația cronostratigrafică și paleoclimatică a unor analize chimice, granulometrice și palinologice în unele așezări paleolitice din bazinul Ceahlăului. Considerații asupra tipului și caracterului așezărilor*, in *SCI VA*, 28, 1977, 2, pp. 157—183; Al. Păunescu, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud-european*, in *SCI VA*, 35, 1984, 3, p. 242.

20. CE AHLĂU, COMMUNE OF CE AHLĂU, DISTRICT OF NEAMȚ PODIȘ

Al. Păunescu investigated the two spots, A and B, in 1956—1958 together with E. Kovacs, V. Căpitanu and M. Brudiu. Some important discoveries were made on spot A : on a 524 sq. m excavated surface several Upper Paleolithic habitation levels were identified.

Geological Stratigraphy

- vegetal black soil, 0.12—0.25 m thick ;
- dusty yellow loess, 0.20—0.25 m thick ;
- brown-reddish fossil soil, 0.30—0.40 m thick ;
- reddish-yellowish loess, 1.10—1.20 m thick ;

— dark red fossil soil, about 2.40 m thick ; at its base 0.50 m thick lenticular veins of gravel and sand of different nuances and structures ;

— sandy yellowish deposit over 0.50—0.60 m thick.

If a synchronization of these sediments with those at Bistricioara-Lutărie could be admitted it results that the fossil soil was formed in a stadial period (maybe the second Würmian stade). The reddish-yellowish soil was then formed during $W_{2,3}$ interstadial as it has loessic features. The reddish-yellowish soil with no habitation traces should belong to W_3 stade, and the dusty yellow loess to Tardiglacial.

Archeological Stratigraphy

The 1.10—1.20 m thick deposit contains four habitation levels :

— level I, belonging to Pregravettian Upper Aurignacian, 0.15—0.20 m thick, contains few habitation complexes and archeological pieces. Faunal remains only of *Mammuthus primigenius* ;

— level II, attributed to Lower Gravettian, 0.15—0.18 m thick, contains few archeological pieces ;

— level III, belonging to Middle Gravettian 0.20—0.25 m thick, contains more traces of human activity ;

— level IV, attributed to Upper Gravettian, 0.15—0.17 m thick, quite poor in archeological material ;

— level V, attributed to Final Gravettian, is situated in the dusty-yellowish sediment ; it is separated from the other levels by a 0.30—0.40 m thick brown-reddish sterile sediment.

Habitation Complexes

Hearths were found in levels II—IV, more numerous in level III. Level V (the richest in lithic tools) contains some calcined pieces but no hearths. Hearths in level III might be elements of special shelters.

Palaeofauna

Small bone fragments in all Gravettian levels, but their preservation state didn't allow identification of species. Remains of *Equus caballus fossilis* molars in levels II—IV.

Lithic Assemblages

Only some of the levels present lithic workshop characteristics. Gravettian lithic tools at Podiș are relatively homogeneous and varied :

— level II contains only 46 typical tools : 7 retouched blades, 9 „à bord abattu“ blades, 3 Gravette points, 20 end scrapers on flakes and blades (with their active side convex), of which only 4 concave and 1 nosed, 7 dihedral, angle on a break and on retouched truncation burins ; 10 prismatic and pyramidal nuclei, 74 unretouched lamellar flakes, 90 unretouched blades and about 830 debitage pieces must also be added ;

— level III, very rich in comparison with the other levels at Ceahlău-Podiș, contains about 290 typical tools and over 1,700 debitage materials :

— conical, prismatic and shapeless nuclei	20 — 6.90 %
— lamellar flakes, some with utilization retouch	9 — 3.10 %
— blades, some with utilization retouch	124 — 42.87 %
— obliquely retouched blades	16 — 5.53 %
— „à bord abattu“ blades and Gravette points	26 — 9.40 %
— truncated blades with encoches	2 — 0.60 %
— microlithic piece resembling the Azilian point	1 — 0.30 %
— perçoirs on flakes	2 — 0.60 %
— end scrapers on flakes and blades, most of them convex, some nosed, shouldered or carinated	46 — 15.90 %
— angle on a break or truncation burins, medium-size, some double	42 — 14.50 %
— end scraper-burin	1 — 0.30 %

— level IV contains 50 typical pieces : 12 retouched blades, 11 „à bord abattu“ blades, 4 Gravette points, 1 retouched on oblique truncation blade, 13 end scrapers on flakes and blades, 8 angle on a break, on retouched oblique truncation, dihedral or multiple burins, and 1 end scraper-burin ; about 430 debitage pieces must also be added ;

— level V, extremely rich, contained 334 typical pieces, besides 25 prismatic and pyramidal nuclei and 511 unretouched blades and lamellar flakes. Typologically, the following tools were identified :

— retouched blades	70 — 20.96 %
— blades with retouched truncation	6 — 1.80 %
— denticulate blades	3 — 0.90 %
— blades with encoches	6 — 1.80 %
— „à bord abattu“ blades	77 — 23.05 %
— Gravette points	60 — 17.96 %
— perçoirs	3 — 0.90 %
— end scrapers-perçoirs	2 — 0.60 %
— end scrapers on blades and flakes, convex, nosed, circular, unguiform, double	83 — 24.85 %
— angle on a break, dihedral, déjeté, on retouched truncation, nucleiform and multiple burins	24 — 7.18 %

To these, about 3,400 debitage materials must be added which means that this level contained a large lithic workshop.

Raw material :

— level II — menilite (70.20%), Prut silex (19%), black schist Audia (6.30%), silicified glauconitic gritstone (4.50%) ;

— level III — menilite (50.50%), Prut silex (42%), black schist Audia (3.80%), silicified glauconitic gritstone (3.70%) ;

— level IV — menilite (35.60%), Prut silex (35.10%), black schist Audia (6.20%), silicified glauconitic gritstone (3.10%) ;

— level V — menilite (45.40%), Prut silex (42.60%), black schist Audia (5.80%), glauconitic gritstone and other siliceous rocks (6.20%)

Conclusions

The settlement at Podiș is the second Paleolithic station in Ceahlău area where all Gravettian stages of the zone were identified. Stratigraphic situation and lithic assemblage homogeneity still raise problems. Future investigations might attribute level I (initially dated to a stage of Pregravettian Upper Aurignacian) to Lower Gravettian. An argument would be the technique of abrupt retouch used with microlithic menilite blades. Lack of typical Gravettian pieces was encountered in other Gravettian settlements or habitation levels, too. Moreover, no pieces of Aurignacian or even older technique were found in level I. Such pieces have a high proportion at Crasnaleuca, Cotu Miculinți, Mitoc, Udești, etc. Lithic assemblage homogeneity in levels II—IV — unique stratigraphic situation for the first four levels — and the presence of horse in these levels could frame them in an evolved Gravettian stage, before the last glacial stade. Level V, so similar to level V at Dîrțu (increased number of blades, Gravette points and microlithic pieces), might be a sequence of Final Gravettian, that is, in our opinion, after the last Würmian stage, during the first phases of Tardiglacial. The absence of remains of cold climate animals is striking. The absence of faunal remains in level V and their scarcity in the other levels at Ceahlău could have not only ecological causes but also geological ones.

The settlement at Podiș is the only one where Prut silex is constantly on the second place and has quite high proportions, except level II and I (4.40%). The increased incidence of Buglovian silex from the Middle Prut area could demonstrate some contacts between human communities in those times.

References

C. S. Nicolăescu-Plopșor, M. Petrescu-Dîmbovița, *Principalele rezultate ale cercetărilor de la Bicăz*, in *Materiale*, V, 1959, pp. 45—52; idem, *Șantierul arheologic Bicăz*, in *Materiale*, VI, 1959, pp. 57—63; C. S. Nicolăescu-Plopșor, et al., *Șantierul arheologic Bicăz*, in *Materiale*, VII, 1961, pp. 37—41; C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le paléolithique de Ceahlău*, in *Dacia*, N.S., X., 1966, pp. 5—105.

21. PIATRA NEAMȚ, CITY OF PIATRA NEAMȚ, DISTRICT OF NEAMȚ POIANA CIREȘULUI

History of Research

In 1963, C. Scorpan identified a Gravettian settlement on the upper terrace of the Bistrița River's left side. It is situated at an altitude of about 400—500 m. C. Scorpan carried out the first sondages here. V. Căpitanu continued research through stratigraphic sondages in 1968.

Geological Stratigraphy

On a 1.50 m profile, several levels were identified :
— grey vegetal soil, 0.05 m thick (0.00—0.05 m) ;

- brown-yellowish soil with prismatic detachments, 0.40 m thick (0.05–0.45 m) ;
- sandy-yellowish soil pigmented with fine calcareous concretions, 0.45 m thick (0.45–0.90 m) ;
- sandy soil with numerous calcareous concretions, 0.30 m thick (1.20–1.50 m).

Archeological Stratigraphy

C. Scorpan identified in 1963 only the last habitation level. V. Căpitanu identified two other culture strata. The first habitation level is situated in the sandy-yellowish soil at a depth of 0.90–1.20 m. The second level was identified in the brown-reddish stratum at a depth of 0.45–0.90 m. The third level is situated in the vegetal soil and continues into the brown-yellowish one.

Habitation Complexes

Hearths rich in charcoal, ash and calcined bones were found in the first two levels. Possible lithic workshops due to the concentration of lithic material and faunal remains on a small surface ; had these been found within the hearths perimeter, special shelters would have been discovered.

Palaeofauna

Besides fragments of calcined bones on hearths surface and in culture strata, reindeer molars were found.

Lithic Assemblages

Level I contains 10 burins (dihedral, angle on a break and multiple), 6 convex end scrapers, 4 on blades, 2 on flakes, 1 nucleiform rabot, a partly retouched blade, 1 denticulate blade, 16 unretouched ones and 5 prismatic and pyramidal nuclei.

Level II contains 3 end scrapers on small flakes, 6 burins (2 simple dihedral and 2 multiple), 1 retouched obliquely truncated blade, 1 blade with fine retouch and atypical nuclei.

Level III is poorer ; it contains only 2 convex end scrapers on flakes, 3 burins (dihedral, angle on a break and multiple on truncation), 7 unretouched blades and 1 nucleus fragment.

Microlithic and medium-size pieces are the most numerous. Raw material : menilite, gritstone, black schist Audia. Prut silex in very low proportion:

Conclusions

No Gravettian specific tools (Gravette points and „à bord abattu“ blades and bladelets) were found ; it would mean Poiana Cireşului is an Aurignacian settlement. During the first sondages 2,162 lithic pieces (of which 1,249 were debitage materials) were found, but no Gravette points or „à bord abattu“ blades and bladelets.

From stratigraphic and technical-typological points of view and by analogy with traditional Gravettian classification of Bistrița River terraces (mountainous zone), level I was attributed to Middle Gravettian, level II to Upper Gravettian and level III to Final Gravettian.

In our opinion, the presence of reindeer in the first two culture strata and the unitary character of lithic material would allow to distinguish a single habitation level belonging to an evolved Gravettian stage. Geochronologically, this habitation level might be quite synchronous with levels V — III at Lespezi. It could therefore be placed during Laugerie-Lascaux interstade, paralleled with Iuculane II and Românești climatic oscillations from the geochronological scheme of Romanian Paleolithic.

The last habitation level, most affected by various geological phenomena, might be even more recent.

References

V. Căpitanu, *Descoperiri paleolitice în județele Neamț și Vaslui*, in *Carpica*, II, 1969, p. 7 — 7 — 11.

22. IZVORUL ALB, COMMUNE OF BICAZ, DISTRICT OF NEAMȚ BAICU

History of Research

Both settlements, that on the Baicu terrace and that at Picioru Gol spot, were discovered by M. Matei and Fl. Mogoșanu in 1979 — 1981. The Baicu settlement is situated on a very large confluence terrace at the flow point of Piriul Alb (White Rivulet) into the the accumulation lake at Bicăz. Before the raising of the Bicăz dam, this terrace dominated the minor river bed of the Bistrița. After that the terrace was flooded by the waters of the accumulation lake, making investigations and archeological excavations possible only when the water level was quite low.

Sondages were carried out on both the plateau-like summit dominating Baicu terrace and on its front side.

Geological Stratigraphy

- vegetal soil subjected to intense erosion and slopewash processes, 0.05 m thick (0.05 — 0.10 m);
- soliflucted loess with grey-yellowish sediments and reddish spots of very fine structure, 0.15 m thick (0.10 — 0.25 m);
- reddish-yellowish loessic sediment, 0.20 m thick (0.25 — 0.45 m);
- very compact brownish-reddish soil, 0.35 m thick (0.45 — 0.80 m);
- brown compact sediment with yellowish nuances and grey-bluish vertical infiltrations, 0.55 m thick (0.80 — 1.35 m);
- reddish sediments (darker at the base), 0.35 m thick (1.35 — 1.70 m);
- from 1.70 on, gravels and sand making up the terrace basic alluvia.

Archeological Stratigraphy

In this elevated part of Baicu terrace several habitation levels stratigraphically and typologically framed in different Gravettian evolved stages were identified. Most of pieces (76) found in the soliflucted loess were attributed to Epigravettian; 8 pieces, 4 of which were found at the upper part of the brownish-reddish soil and the other 4 at the upper limit of the brown sediment with yellowish nuances, were attributed to Final and Upper Gravettian, respectively.

A habitation level was identified on the front side of Baicu terrace. It was situated at a depth of 0.90—1.20 m, in a clayey reddish-yellowish deposit dated to Middle and Upper Gravettian on Ceahlău area.

No habitation complexes were found due to the restricted character of excavations.

Lithic Assemblages

Relatively rich and varied lithic materials were found through systematic excavations and surface archeological research.

Baicu Terrace — Sondages

Epigravettian level: 16 pieces, most of them atypical, with archaic features due to the raw material used. Typical tools: 3 burins (double, dihedral on denticulate blade and on retouched encoche of a blade). Raw material: menilite (43 pieces), black schist Audia (14 pieces), silex (11 pieces) and gritstone (8 pieces).

Final Gravettian level contains only 4 pieces: 2 atypical flakes, 1 prismatic nucleus and a „burin blow“ piece made of menilite (2), black schist Audia (1) and gritstone (1).

Middle Gravettian level also contains 4 pieces: 2 end scrapers on Prut silex flakes and 2 on menilite flakes.

Baicu Terrace — Front Side

The first two Gravettian levels here contain 3 pieces (an end scraper on a blade-end, an intact blade and a fragmentary one with utilization traces) and 5 pieces (2 fragmentary blades, 1 fragmentary nucleus and 2 flakes), respectively.

Surface survey gave the following results (for the whole perimeter of Baicu terrace): 271 menilite pieces (43.43%), 160 black schist Audia pieces (25.64%), 150 Prut silex pieces (24%), 23 gritstone pieces (3.68%) and 20 pieces made of other rocks. The following typological tools were identified: 40 end scrapers (22 on flakes, 5 on blade-end, 4 unguiform, 5 nucleiform, 4 convex), 16 burins (most of them dihedral), 7 Gravette points and „à bord abattu“ blades, 4 truncated blades, 3 denticulate blades and 3 blades with encoches.

PICIORU GOL

On this hill side situated on the accumulation lake shore, 223 silex pieces (74.33%), 40 menilite pieces (13.33%), 22 black schist Audia pieces (7.33%),

6 gritstone pieces (2%) and 9 pieces made of other rocks were found. The following tools were identified: 23 end scrapers (7 on flakes, 5 on blade-end, 5 double, 3 nucleiform, 7 convex), 2 end scraper-burins, 11 burins (2 on truncation and 9 dihedral), 1 Gravette point, 2 „à bord abattu“ blades, 1 truncated blade and 2 sidescrapers.

Conclusions

At Izvorul Alb, two Paleolithic settlements belonging to Gravettian were discovered and not enough investigated. A few Aurignacian pieces were found on the higher part of Baicu terrace, at the base of the sediment. Gravettian habitation levels were dated according to the traditional classification of this culture on the Bistrița River terraces in the mountainous zone (Ceahlău). Although stratigraphic position seems clear, the few pieces (3—8 in each culture stratum) found here don't allow even a general Gravettian classification. Only the Gravette points and „à bord abattu“ blades date these habitation levels to Gravettian. The sporadic character of the settlement itself calls for utmost caution as regards very exact and sure cultural framing.

References

Fl. Mogoșanu, M. Matei, *Noi cercetări paleolitice în zona Bicăz*, in *SCI VA*, 32, 1981, 3, pp. 413—421; idem, *Noi cercetări și săpături arheologice în așezările paleolitice de la Izvorul Alb—Bicăz*, in *SCI VA*, 34, 1983, pp. 243—248.

23. BICAZ, TOWN OF BICAZ, DISTRICT OF NEAMȚ CIUNGI

History of Research

M. Drăgotescu discovered a Paleolithic settlement on the lower terrace of the Bistrița River in 1964 and carried out a stratigraphic sondage. Further investigations were made by M. Bitiri in 1969 and 1971.

Geological and Archeological Stratigraphy

According to M. Brudiu, who quotes M. Drăgotescu's observations, horizons A and B are thin and only partly preserved. Horizon C (0.40—1.00 m thick) is dark brown. Horizon D is made up of a yellow loessic deposit with rust-like and grey pigmentations; it has two sub-horizons: a) clayey, 1.50 m thick; b) with a sandy structure.

The Upper Gravettian culture stratum (according to traditional chronology of the Bistrița terraces in the mountainous zone) is about 1 m thick and is situated in a sub-horizon of horizon D.

Habitation Complexes

Two concentrations of lithic material without faunal remains could be traces of lithic workshops. Two hearths with a 0.30 m stratigraphic difference were found; no data concerning their being situated within the perimeter of workshops.

Lithic Assemblages

The whole lithic material is dominated by "à bord abattu" blades and Gravette points (60%). Among other tools, the following were identified: end scrapers on small blades and flakes, nuclei, burins, retouched blades, double-functional tools and denticulate pieces.

Quite numerous microlithic pieces, although Prut silex is present in a percentage of only 10%. Other materials: menilite (80%), gritstone and black schist Audia (10%).

Conclusions

Taking into account only the presence of hearths, six habitation levels were identified at Lespezi. Although the two hearths found at Ciungi-Bicaz are situated at a 0.30 m stratigraphic difference, technical-typological and stratigraphic features give the whole archeological level a unitary character. M. Drăgolescu attributes it to Upper Gravettian. Since there are no data concerning number, proportion and subtypes of tools and no radiocarbon or palynological determinations were made, it is difficult to estimate the age and geochronological position of this Gravettian settlement.

References

M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova*, București, 1974, pp. 77—78.

24. VALEA URSULUI, COMMUNE OF VALEA URSULUI, DISTRICT OF NEAMȚ LA DEAL DE SAT

History of Research

The settlement was discovered, investigated and systematically excavated by M. Brudiu in 1971. It belongs to the Birlad Plateau and is situated on the left side of the Siret River, near the springs of the Birlad River. It enters the category of settlements placed on high hills typical for the last Gravettian stages.

Geological Stratigraphy

- present-day vegetal soil, 0.30 m thick (0.00—0.30 m);
- transition soil, 0.20 m thick (0.30—0.50 m);
- glazed red soil, 0.50 m thick (0.50—1.00 m);
- under 1.00 m, loessic sediments, archeologically and faunistically sterile.

Archeological Stratigraphy

The only habitation level was identified at the upper part of the glazed red soil and the lower part of the transition soil.

Habitation Complex

Four concentrations of oval-round shape archeological materials were found on the soil surface. The same relatively uniform character of lithic piece in the culture stratum. Traces of a special shelter with a surface simple hearth ; it was partly destroyed, only a very thin layer of ash and isolated charcoal being preserved. Lithic workshop as a component of the shelter.

Palaeofauna

Few remains allowing identification of species (molars belonging to bovides). Other smaller skeleton fragments destroyed by soil acidity.

Lithic Assemblages

Archeological investigations concentrated on two agglomerations of lithic pieces. The following types of tools were identified in the larger one :

— end scrapers on blade-end (2) and flakes (13)	15—24.90%
— end scraper-burin	1— 1.60%
— burins : dihedral dejetle (2), angle (3), on retouched truncation (3), mixed (1), of Noailles type (1), nuclei-form (1), flat (1)	12—29.70%
— Gravette points, of which 7 with retouch on the flat side	14—23.30%
— atypical shouldered piece	1— 1.60%
— „à bord abattu“ blades	10—16.60%
— strangulated blade	1— 1.60%
— sidescrapers	4— 6.60%
— blade with encoche	1— 1.60%
— pyramidal nuclei with one or two blowing planes	20
— crested blades	7
— unretouched blades	67

To all these, 582 atypical debitage pieces are to be added : decortication fragments, shapeless flakes, clods and nuclei in various processing stages.

Most of raw material are rocks of Carpathian origin : silicified glauconitic gritstone (26.60%), black schist Audia (23.50%), menilite (7.90%), high quality Middle Prut silex (42%).

The second complex contains just a few tools : 1 end scraper, 1 end scraper-burin, 3 „à bord abattu“ blades and 17 unretouched blades.

Conclusions

Lithic material of a certain homogeneity. Gravette points with retouch on the flat side similar to those found at Ripiceni—Izvor—Valea Badelui and in Climente I — Dubova cave (Iron Gates area).

Geochronologically, M. Cârciuraru attributed this settlement to the *Pinus—Picea* transition episode of the pine phase. It might belong to Bolling climatic oscillation in Tardiglacial.

M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova. Studiu arheologic*. București, 1974, pp. 122—124.

25. BUDA, COMMUNE OF BLĂGEȘTI, DISTRICT OF BACĂU DEALUL VIEI

History of Research

As a result of some surface research on Dealul Lung hilly massif, on one of the promontories called Dealul Viei, bone remains and silex pieces with intense patina were found.

C.S. Nicolăescu-Plopșor, V. Căpitanu, C. Buzdugan, and V. Ursache carried out investigations here in 1958. They were continued by V. Căpitanu, C. Buzdugan and V. Ursache in 1959.

Geologically, Dealul Viei represents a relief dorm carved in the Tertiary deposits of the gritstone-diorite sand complex of Moldavian Plateau in Pliocene.

Geological Stratigraphy

- vegetal soil, a few cm thick ;
- dusty-yellowish deposit, 0.30 m thick, attributed by the team of researchers to Würm III glacial stade ;
- brown-reddish layer with prismatic detachments, 0.60 m thick, belonging to Würm₂₋₃ interstade ;
- layer rich in CaCO₃ of a pseudo-micellian aspect similar to the levels in Râpciuni Basin (Ceahlău area).

The authors precise that the atypical flakes found at a depth of 0.50—0.60 m *in vertical position* came from the upper level. This situation represents a quite frequently encountered periglacial phenomenon specific to the whole outer sub-Carpathian Depression. It was noticed in most stations on the Bistrița terraces and in Întorsura Buzăului Depression.

Archeological Stratigraphy

- between 0.10—0.30 m, a few atypical flakes and a sidescraper on a massive blade were found ;
- between 0.50—0.60 m, only the 3 vertical pieces were found ; they came from the upper stratum due to the frozing-thawing phenomenon ;
- between 0.80—0.90 m, a superficial habitation level with very few lithic pieces and faunal remains was found ; 1 menilite sidescraper-burin, Gravette points, 1 double burin and 1 convex simple sidescraper were identified ;
- between 1.20—1.30 m (with scatters between 1.00—1.40 m), a rich habitation level with numerous lithic pieces was found.

It is to be noticed that the richest faunal remains were found at the soil surface and at a depth of 0.60—0.90 m.

No habitation complexes ; the rich bony material is either due to a form of worship of hunting magic or represents domestic remains.

Palaeofauna

Most of palaeofaunal remains, first studied by Al. Bolomey and then by O. Necrasov and M. Ştirbu, belong to bovids and reindeer. An amount of 1,239 bone fragments were identified ; they belong to : *Bos primigenius* Boj and *Bison priscus* Boj (1.100—89.58%), *Rangifer* sp. (123—9.92%) *Cervus elaphus* L. (1—0.08%) and *Equus* sp. (5—0.40%). Intact whole pieces (molars, jugals, astragali, heels and phalanges), but also fragments of shoulder blade, humerus, radius, hip joint, thighbone, tibia, metacarpus and metatarsus were identified. A neuro-skull fragment and some fragmentary mandibles were also found.

Lithic Assemblages

Level I, the richest of all, contains 337 lithic pieces :

- 64 end scrapers on flakes and blades, with their active side convex, some of blades with retouched sides, a few carinated (19%) ;
- 9 end scraper-burins (2.67%) ;
- 57 burins : dihedral, angle on a break and on retouched oblique or concave truncation (30) and multiple (23) (15.73%) ;
- 91 “à bord abattu” blades (27%) ;
- 29 Gravette points (8.61%) ;
- 66 retouched blades (19.59%) ;
- 5 atypical shouldered points (1.50%) ;
- 2 perçoirs on blade point (0.60%) ;
- 1 segmentiform piece with its arched side abruptly retouched (0.30%) ;
- 2 blades with retouched truncation (0.60%) ;
- 2 thinly denticulate blades (0.60%) ;
- 11 blades with retouched encoches (3.20%) ;
- 2 „burin blow” blades (0.60%).

Raw material : Prut silex (58.33%), menilite (31.77%), black schist Audia (4%), gritstone (2%) ; besides these, several pieces are made of obsidian (which see Udeşti).

Conclusions

According to the scheme of the Gravettian at Ceahlău, this habitation level is attributed to Middle Gravettian.

On certain criteria concerning pedological and sedimentary similitudes with geological levels at Buda and Ceahlău, Gravettian at Dealul Viei was attributed to the whole Ohaba interstadial complex, paralleled with Arcy Stillfried (Arcy-Kesselt) climatic oscillations. But the oscillations are dated to 30,000—28,000 B.P. which contradicts the cultural framing of lithic material.

On the basis of the first faunal remains this habitation level was thought to have belonged to a rough climatic period. This was done starting from the

presence of reindeer without taking into consideration the higher incidence of bovids and their power of adaptation to climate.

In our opinion, this settlement might belong to a period immediately after the last glacial stade; the fossil reindeer remains could come from its being hunted high in the mountains where the characteristics of stadial climate were still obvious due to geographic conditions. Bovides could easily adapt to the periglacial zone this settlement belongs to.

References

C.S. Nicolăescu-Plopșor, V. Căpitanu, C. Buzdugan, V. Ursache, *Cercetările și săpăturile arheologice de la Buda*, in *Materiale*, VII, 1961, pp. 21—25; V. Căpitanu, C. Buzdugan, V. Ursache, *Săpăturile arheologice de la Buda*, in *Materiale*, VIII, 1962, pp. 131—133; V. Căpitanu, *Așezarea paleolitică de la Buda-Blăgești*, in *Rev. Muz.*, IV, 1967, 4, pp. 267—271; Al. Păunescu, *Evoluția uneltelor și armelor de piatră cioplită descoperite pe teritoriul României*, București, 1970, p. 129; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 171—189; Al. Paul-Bolomey, *Notă asupra resturilor fosile de la Buda*, in *Materiale*, VII, 1961, pp. 25—27; O. Necrasov, M. Bulai-Știrbu, *Contribuții la studiul faunei pleistocene de la Buda (jud. Bacău) cu o privire specială asupra caracteristicilor renului*, in *Carpica*, 1971, pp. 7—19.

26. LESPEZI, COMMUNE OF GÎRLENI, DISTRICT OF BACĂU LUTĂRIE

History of Research

This Gravettian pluri-stratified station is one of the most important ones on the Bistrița River valley. It was discovered during a clay pit exploitation when lithic pieces, faunal remains and hearths were noticed. M. Bitiri and V. Căpitanu made systematic excavations here between 1962 and 1968.

The settlement is situated on a promontory at the foot of Pașcanu hill about 30 m over the Bistrița level.

Geological Stratigraphy

Basic gravels are situated at a depth of about 20 m.

A massive deposit of yellow loessic clay, slightly sandy lies under them. It is made up of several horizons:

- dark yellow fine sandy clay, 8—9 m thick;
- dark yellow clayey-sandy layer, with yellow-reddish, yellow-bluish and brown-reddish lens and a few calcareous concretions, 1.20 m thick;
- yellow-whitish loessoid layer with numerous calcareous concretions and vertical and diagonal fissures, 0.50—0.70 m thick;
- yellowish reddish soil, 1.50 m thick, made up of argillaceous clay with prismatic structure, fine gravels lens and numerous calcareous concretions at the upper part;
- grey-yellowish finely sandy clayey soil, 0.30 m thick;
- brown-grey present-day soil, 0.30 m thick, with lithic pieces from the last culture stratum at the lower part.

Frequent incidence of sand and gravel horizons was noticed. The level containing loessoid clays is extremely mixed up which explains the lack of expected results of palynologic test.

Archeological Stratigraphy

M. Bitiri and V. Căpitanu paralleled this promontory with the 40—50 m Bistrița River middle terraces in Ceahlău area since it is higher than the lower terrace of the river. First habitation levels were found at a depth of 6.50 m. Stratigraphic delimitation of archeological levels was made in relation with the position of hearths as no sterile strata delimiting eventual real habitation levels were found.

The first habitation level (VI) was identified at a depth of 6.30—5.00 m, at the upper part of the dark yellow finely sandy clay.

Level V is situated at the upper part of clayey-sandy sediments between 4.50—3.80 m.

Level IV was identified at a depth of 3.70—3.20 m, in the same dark yellow clayey-sandy sediments.

Level III belongs to the dark yellow clayey-sandy horizon with differently coloured lens and calcareous concretions, at a depth of 3.00—2.50 m.

Level II was identified at a depth of 2.20—1.40 m and belongs to the upper part of the subjacent geological level and to the lower part of the yellowish-whitish sediment with numerous calcareous concretions and vertical and diagonal fissures.

Level I, situated at a depth of 0.50—0.20 m, represents the last Gravettian habitation level. The culture stratum is superficial and contains uniformly scattered archeological materials.

Habitation Complexes

In all habitation levels (except the last one) rich habitation complexes were identified. They have various dimensions. Hearths surrounded by numerous lithic pieces and faunal remains were found.

Hearths in level VI are mere burnt spots. Erosion processes have greatly destroyed charcoals. Near such a hearth nuclei, decortication pieces, flakes and blades belonging to a lithic workshop were identified.

Same burnt spots but also charcoals were found in level V. Radiocarbon analyses dated this level to $18,020 \pm 350$ B.P. (Bln-808). The sample was taken from a hearth situated at a depth of 3.80 m. Debitage waste suggest possible lithic workshops.

Agglomerations of lithic pieces and faunal remains in level IV are more convincing. They were less affected by geological processes. Hearths in this level may be divided into three categories: surface hearths, deepened ones and hearths lined with stone slabs. One of them had a diameter of 0.80 m, was 0.18 m deep and over 500 lithic pieces belonging to a lithic workshop were found around it. Not only charcoals but also silex pieces and fragments of calcined bones were identified. Another complex consisted of a 2×1.5 m hearth, palaeofaunal remains and 31 stones of various dimensions bordering its perimeter.

Level III is also rich in hearths and lithic workshops. Charcoals from a hearth found at a depth of 2.30 m dated this level to $18,110 \pm 300$ B.P. (Bln-806).

Two habitation complexes containing hearths, lithic pieces, faunal remains and stone slabs have features of purposely arranged buildings.

Out of the 14 hearths found in level II, only 2 have well preserved characteristics, the other ones being mere burnt spots 5–15 cm thick. Rich lithic material and faunal remains were found near the two deepened hearths. Given the gritstone slabs (which could be used as anvils) they might have been elements of some seasonal simple shelters. Traces of complexes in squares C-D-14–16, D-18–25 and D-E-9-10 are to be noticed.

Charcoals taken from the hearth of D-E-9-10 complex at a depth of 1.50 m dated this level to $17,620 \pm 320$ B.P. (Bln-805).

Palaeofauna

Rich faunal remains were identified in all levels, except levels I, where they (as well as the hearths) might have been destroyed by geological processes and agricultural activities.

Bone and teeth fragments of *Rangifer tarandus*, *Equus caballus*, *Bos s.* *Bison* and *Elephas primigenius* were identified in level VI. Since the bone remains of *Elephas primigenius* were found at a depth of 9 m and the first habitation level (VI) was identified from – 6.30 m on, this species must belong to a much older geological deposit.

Level IV contains both rich remains, some of which impossible to date found in hearths, and traces of a real faunal complex with teeth, jaws and bones broken on purpose. Remains of *Rangifer tarandus* (most of them), *Equus caballus*, *Bos s.* *Bison*, *Cervidae*, *Cervus elaphus*, *Elephas primigenius* and *Lupus sp.* were identified near hearths and in the culture stratum. Most of faunal remains in this level are horns and fragments of skulls which suggest an intense hunting activity. The settlements on the Prut at Cotu Miculinți and Crasnaleuca contain numerous antlers and reindeer horns but they don't come from hunted animals. Reindeer presence suggests a periglacial climate dated between $18,020 \pm 350$ and $18,110 \pm 300$ B.P. as the settlement was situated very near to sub-Carpathian zone.

Elephas primigenius remains presence is strange, although their nature is not precised.

Level III contains calcined remains found in hearths. Their state of preservation didn't allow identification of species.

Level II is better represented from this point of view. *Rangifer tarandus* teeth and horns with fragments of skull, *Equus sp.* fragments of jaws and bones of anterior and posterior limbs broken on purpose were identified.

Lithic Assemblages

Lithic pieces are most important for cultural framing of habitation levels, although only about 10% of them are typical finished tools, 90–95% being debitage waste: clods and nuclei in various processing stages, decoration pieces, atypical flakes, etc.

Level VI contains only 4% typical pieces : 5 retouched blades, 6 burins, 4 end scrapers and 1 sidescraper, almost all on flakes. Burins are : middle, angle on retouched oblique truncation and double. Two of end scrapers are on blade-end with retouched sides and 2 on flakes. The only sidescraper is on a middle flake with bigger detachments on the dorsal face and smaller to the edge ; alternate retouch on one of the sides. A large blade with encoche and 1 atypical shouldered piece were also found.

Raw material : gritstone from the minor river bed of the Bistrița (95 %), menilite and silex.

Level V

Out of the 1,752 lithic pieces only 5% are tools : obliquely retouched blades with fine retouch, "à bord abattu" blades and bladelets, Gravette points, "burin blow" blades and bladelets, Dufour blades, crested blades, 2 atypical shouldered pieces, 14 end scrapers on flakes and blades (some of them fragmentary) with retouched sides, some carinated ones, 2 end scraper-burins, 2 multiple burins, 2 on flakes with concave retouched truncation, 3 on oblique truncation, 2 on thick flakes with convex truncation, 5 straight dihedral on middle flakes.

Raw material : gritstone from the river bed of the Bistrița (61 %), menilite (19%), Prut silex (13%), black schist (7%). Typical tools (end scrapers, burins, etc.) are made of the best quality rocks, while flakes and blades were used as such, without being finished as typical tools.

Level IV

Typical tools in this level reach 10% of the whole lithic material. The following were identified :

- 23 retouched blades and flakes ;
 - 6 burins on flakes and blades with a retouched side ;
 - 4 burins on blades with unretouched oblique truncation ;
 - 2 multiple burins on flakes with retouched concave truncation ;
 - 1 burin on denticulate blade ;
 - 1 double burin on blade in trapezoidal section through detachment of „burin blow“ blades ;
 - 4 burins on blades with retouched oblique truncation ;
 - 7 dihedral and angle on a break burins ;
 - 2 end scraper-burins ;
 - 19 convex end scrapers, of which 2 double on short and thick flakes and blades ;
 - 29 abruptly retouched microlithic pieces (most of them Gravette points ;
 - 4 Dufour blades ;
 - 3 denticulate blades of a type not found in previous levels ;
 - 3 perçoirs not found in levels VI and V, either ;
 - 1 massive sidescraper on menilite flake, 21 × 17 × 6 cm, of bifacial aspect due to large detachments whose negatives can be seen on both faces.
- Other massive flakes were used without further retouch.

Raw material: Prut silex (35%), gritstone (35%), menilite (23%).

Level III

Only 5% of the whole lithic material are typical tools. The following types were identified :

- 29 end scrapers, of which 19 on intact blades, 20 made of high quality silex, most of them convex on short flakes ;
- 4 angle on a break burins ;
- 10 burins on truncated and retouched flakes and blades ;
- 3 multiple burins on flakes and blades with retouched concave truncation ;
- 4 atypical burins ;
- 2 end scraper-burins ;
- 6 percoirs on blades with bilateral fine retouch ;
- 3 blades with retouched encoches ;
- 7 intact and 5 fragmentary Gravette points ;
- 11 „à bord abattu“ blades of which 5 with retouched straight or oblique truncation ;
- 1 Dufour bladelet ;
- 12 partly or totally retouched blades and flakes ;
- 50 nuclei, most of them prismatic or pyramidal and only 8 atypical.

Raw material : menilite (54%), gritstone (22%), silex (9%) and rocks of local origin.

Level II

The same 5% of typical tools. Very few denticulate blades and double-functional tools (end scraper-burins). Almost no Dufour blades. A number of 23 convex end scrapers, some on blades with retouched sides, 7 on micro-lithic blades were identified. Burins : on obliquely truncated flakes and blades, concave or convex (8), double (2), angle on a break (2), dihedral (2). Most of end scrapers and burins, the Gravette points, Dufour and „à bord abattu“ blades or percoirs (2 simple and 2 combined) are made of Prut silex. Out of the 38 nuclei 15 are prismatic, 8 pyramidal and 15 shapeless.

Raw material : Prut silex (34%), menilite, gritstone, black schist.

Level I

It is the poorest in lithic pieces, scattered on the whole surface and stratigraphically. It contains few typical tools: end scrapers (1 double), end scrapers-burins, several abruptly retouched points and blades. Raw material : gritstone (used for the detachment of flakes without further retouch), silex and menilite.

Other Discoveries

We may include here the ochre clod found in level IV and the *Rangifer* molar on a thin ochre layer maybe with ritual purpose. Agglomerations of red ochre were also found in other Gravettian habitation levels ; they might have been used as adornment elements.

Conclusions

This extremely rich Gravettian station was discovered 20 years ago and published several years later. It raises various problems concerning geolo-

gical and archeological stratigraphy, habitation complexes, faunal remains and lithic inventory.

Real archeological levels are, however, separated by horizons of variable thickness (0.80—0.10 m) in which no lithic pieces or faunal remains were found. Culture strata are 0.30—1.30 m thick. They are consistent enough given that there are settlements on the Bistrița terraces but in Ceahlău area in whose 1m thick stratigraphic profile 3—4 habitation levels were identified.

Habitation complexes and the rich archeological levels prove the existence of a long-term settlement. Even if the promontory on which it is situated were a sliding delluvium, such an accumulation of materials would need a long time which demonstrates its quasi-permanent character. Obviously, human communities have sometimes left the settlement in search for food or raw material or because of climatic deteriorations, but they came back to this place which offered such favourable ecological and geographical conditions. Palynological analyses couldn't testify these changes because geological processes and erosion have affected natural evolution of sedimentation and modified its stratigraphic unity.

On the basis of C-14 tests the whole sediment and all habitation levels were attributed to Herculane II and Românești climatic oscillations, the period separating them included. This could explain the massive presence of reindeer. This cold climate animal could be hunted only in mountainous and sub-mountainous periglacial zones provided that favourable conditions were not followed by the retreat of ice cap. Bovides and horses couldn't adapt themselves to this rough climate. That is why, in our opinion, it could be possible that charcoals taken for radiocarbon analyses belonged to other habitation levels which "had fallen" together with the whole sediment. In level V, for instance, dated to $18,020 \pm 350$ B.P., only "burnt spots completely washed down to the burnt earth, ash and isolated charcoal" were found. M. Cărciumaru considers that a sediment of about 3.10 m (levels V—II) accumulated only in several hundreds of years would mean a unique and beyond normal limits accumulation speed.

Characteristics of lithic pieces and faunal remains seem to generally correspond to radiocarbon determinations. In this context, the presence of *Elephas primigenius* remains could be explained by building necessities, situation already encountered at Mitoc-Malul Galben. More important seems to be the discovery of numerous fragments of jars within hearths perimeter. As they couldn't have been used as fuel, it means they might be proofs of food preparation; this activity seems more accentuated here than in other settlements.

If rocks of Carpathian origin could have been brought by human groups from flysch zone (while hunting), or by the Bistrița waters, the presence of Prut Buglovian silex might reflect certain contacts between human communities on the Bistrița and Prut terraces probably due to climate changes. But, if Buglovian silex had to be brought (as finished tools, sometimes) from Middle Prut area, the shouldered pieces in levels VI and V at Lespezi might reflect direct contacts with Kostienki or Kostienki-Avdееvo communities.

Therefore, this pluri-stratified station does not represent (as it was the case at Ceahlău) as many cultural levels, but just several habitation stages.

They are subsequent to those at Mitoc-Malul Galben, dated to $20,945 \pm 850$ (GX-8503), $20,300 \pm 700$ (GrN-14031), $19,910 \pm 990$ B.P. (GX-8724), and those at Crasnaleuca, dated to $19,460 \pm 220$ (Bln-1443).

From this point of view, all these settlements are among the earliest human habitation levels in south-eastern and Central Europe. They can be attributed to the period after the retreat of ice cap and its maximum advance during the last Würmian stade.

References

M. Bitiri, *O nouă aşezare paleolitică pe valea Bistriței*, în *SCIV*, 14, 1963, 1, pp. 135—137; M. Bitiri, V. Căpitanu *Aşezarea paleolitică de la Lespezi, județul Bacău, în Carpica*, 1972, pp. 39—68; M. Cărciumaru, *Mediul geografic în pleistocenul superior şi culturile paleolitice din România*, Bucureşti, 1980, pp. 173—174.

27. CURTENI, COMMUNE OF OLTENEŞTI, DISTRICT OF VASLUI GRĂDINA LOCUITORULUI M. CIŞU

History of Research

Gh. Melinte identified this settlement in 1952. V. Căpitanu carried out a limited sondage in 1968.

Geological and Archeological Stratigraphy

On a 1.75 m profile, the following sediments were identified:

- vegetal black soil, 0.25 m thick (0.00—0.25 m);
- black-grey soil, 0.20 m thick (0.25—0.45 m);
- yellow layer containing lithic pieces, 0.10 m thick (0.45—0.55 m);
- layer with prismatic detachments in a reddish soil, 0.55 m thick (0.55—1.10 m);
- sandy yellow soil with calcareous concretions at the base, 0.65 m thick (1.10—1.75 m).

No habitation complexes or faunal remains.

Lithic tools: unretouched blades and bladelets, unretouched macro-lithic lamellar flakes.

Insufficient elements to precisely date this sporadic settlement. Its being attributed to Gravettian is highly probable.

References

N. Zaharia, M. Petrescu-Dimbovița, Em. Zaharia, *Așezări din Moldova. De la paleolitic până în secolul al XVIII-lea*, București, 1970, p. 318; V. Căpitanu, *Descoperiri paleolitice în județele Neamț și Vaslui*, în *Carpica*, II, 1969, pp. 13—15.

28. MĂLUȘTENI, COMMUNE OF MĂLUȘTENI, DISTRICT OF VASLUI MĂLUȘTENI II—V

Paleolithic settlements at Mălușteni (I—V), situated in the southern part of Moldavian Plateau, belong to Final Gravettian and are similar to

those at Dorohoi-Strachina, Topile-Valea Seacă etc. As regards Mălușteni, only the first settlement belongs to Epipaleolithic.

History of Research

The first to describe fossil faunal remains found here was Ioan Simionescu. Traces of Paleolithic habitation levels were identified by M. Brudiu in 1969. He made systematic excavations here together with Eug. Popușoi (1969—1971) and M. Mantu (1977—1978).

MĂLUȘTENI II — DEALUL LEAUA

Geological and Archeological Stratigraphy

- tillable soil at the ground surface, 0.20—0.30 m thick ;
- chocolate coloured soil ;
- clayey soil with ash lens at the upper part ; no published study contains further information about geological strata situated under the present-day level. A single archeological level, situated at the upper part of clayey soil, in the ash lens perimeter, was identified.

Habitation Complexes

The ash lenses are rich in lithic pieces ; they are irregularly-shaped and have various thickness ; they might be traces of seasonal shelters meant to protect fire-hearths (isolated charcoals were found, the hearths having been destroyed by high erosion).

Conclusions

M. Brudiu considers that the settlement at Mălușteni II — Leaua could belong to the last Gravettian surviving elements at the beginning of Holocene.

Palynologic analyses date this settlement to the second half of Boreal, that is after the Mediterranean-like Tardigravettian at Dubova. Lack of specific Epipaleolithic pieces doesn't allow the framing of this settlement in such a period. Scarcity of lithic pieces and the limited character of investigations don't permit more detailed remarks.

MĂLUȘTENI III — PĂDUREA STURDZA

Geological and Archeological Stratigraphy

The 0.25 m thick vegetal soil superposes a grey layer, under which lies a grey with yellowish nuances one. The latter superposes a clayey-loessoid sediment. A layer of loess with calcareous infiltrations superposed by pure loess lies at the profile base.

Pedologically, the following sediments were identified :

- Aa₂, medium clay-heavy clay (0.00—0.18 m) ;
- A(a₂), 0.18—0.33 m ;
- Ab(a₂), heavy clay, 0.33—0.60 m ;
- B₁, heavy clay, 0.60—1.14 m ;

- B, heavy clay-medium clay, 1.14—1.34 m ;
- B₂, medium clay-heavy clay, 1.34—1.78 m ;
- C, medium clay + CaCO₃, 1.78—1.86 m.

Lithic pieces, that is habitation levels, are situated in the grey soil with yellowish nuances. in pedological horizons Ab(a₂) and B₁.

Habitation Complexes

Owing to the very seasonal character of the settlement, no traces of shelters were found. Isolated charcoals show the presence of hearths destroyed by geological phenomena.

Lithic Assemblages

Small quantity and low diversification of lithic pieces confirm the very sporadic character of the settlement :

- end scrapers (2 on blade-end. 7 on flakes, some nucleiform or of the high type 9
- burins (dihedral or on retouched truncation 2
- end scraper-burin 1
- perçoir 1
- point with a retouched arched side resembling the Azilian type . . 1
- blade with encoches 1
- retouched blades or with utilization retouch, of which 1 crested . 5
- nuclei with one or two blowing plans 2

On typological-stratigraphic criteria and according to palynological analyses, this settlement was attributed to Early Holocene, during the *Pinus-Picea* transition episode of pine-phase.

MĂLUȘTENI IV — STEJARUL LUI FILIUȚĂ

Geological and Archeological Stratigraphy

- vegetal soil, 0.15—0.20 m thick ;
- reddish soil with prismatic detachments and intensely glazed ; thickness not precised ;
- yellow-reddish soil with few prismatic detachments, 0.40—0.60 m thick ;
- yellow deposit of sandy loessoid aspect, 0.30 m thick ;
- loess with rich calcareous sediments.

Only one habitation level was identified in second yellow stratum with prismatic detachments.

Habitation Complexes

In areas where concentrations of surface lithic pieces were found they had the same characteristics in the culture stratum, too. Improvised shelters with lithic workshops, hearths and isolated charcoals were identified.

Palaeofauna is represented by aurochs, bison and horse molars.

Lithic Assemblages

Numerous debitage waste (over 4,000) and few typical tools were identified :

— end scrapers on blade-end	23
— fan-shaped and on flakes end scrapers	59
— unguiform end scrapers	3
— carinated, nosed and nucleiform end scrapers	20
— end scraper-percoirs	3
— burins : dihedral (6), angle (2), on retouched concave and oblique truncation (4), nucleiform (3) and other types (11)	26
— end scraper-burins	4
— Gravette points and „à bord abattu“ blades	18
— Dufour blades	28
— saw-type piece	1
— écaillée piece	1
— unretouched and crested blades	16
— unretouched or with utilization retouch flakes	8
— nuclei with one or two blowing plans, some shapeless	32

Raw material: Prut silex (99%), Carpathian rocks (menilite, black schist Audia) and a yellow-waxed silex.

Conclusions

This culture stratum represents the richest habitation level discovered and investigated in Mălușteni area. Seasonal settlements but intense carving-cutting activity. Presence of Prut silex means either contacts with human groups in this area or occasional moves of local communities in search for better quality raw materials. Utilization with utmost efficiency of Prut silex resulted in high microlithization.

The settlement was attributed to Final Gravettian ; no elements concerning its duration or geochronological framing. Palynologically dated to the pine-phase.

MĂLUȘTENI V — CHIȘTELE

Geological stratigraphy totally modified by tilling activity. The archeological stratum is situated in a reddish clayey-sandy soil.

Eventual habitation complexes destroyed by vineyard plantations which affected the soil to a depth of 0.80 m.

Lithic Assemblages

Some debitage waste and a few finished tools : end scrapers (2 on blade-end and 3 on flakes), burins (4 dihedral, 1 angle on a break), 1 Mousterian-like sidescraper, 1 Gravette point, 1 „à bord abattu“ bladelet and 1 Dufour bladelet.

High microlithization due to utilization of Prut silex.

Conclusions

Out of the 5 settlements at Mălușteni situated quite near one another, 4 belong to east-Carpathian Final Gravettian.

Cultural and chronological limits between Gravettian and Epigravettian have not been strictly established yet. However, the features of lithic pieces, stratigraphy and palynological analyses carried out in Mălușteni IV, III and II settlements would date them to Epigravettian and frame them in Early Holocene. Archeological levels are too near to the present-day soil surface to permit any other statements.

These discoveries are important as proofs of the south of Moldavian Plateau being inhabited only at the end of Würm₃ stade, after the retreat of ice cap. At that time, not only faunal elements but human communities as well might have abandoned the northern areas of this territory. Their coming back to the old settlements after „Maximum Valdai“ (as O. Soffer called the period of very cold climate during the last Würmian stade) is proved by the settlements on Middle Prut and the Bistrița terraces (mountainous zone). A new cold episode during Tardiglacial could have made human communities to move south; they stayed here up to Early Holocene being contaminated by Epipaleolithic influences.

References

M. Brudiu, Eug. Popușoi, *Cercetări paleolitice la Mălușteni (jud. Vaslui)*, in *Carpica*, IV, 1971, pp. 21–29; M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova. Studiu arheologic*, București, 1974, pp. 105–112; M. Brudiu, Eug. Popușoi, *Rezultatele cercetărilor paleolitice de la Mălușteni, jud. Vaslui (1969–1971)*, in *Danubius*, VIII–IX, 1979, pp. 7–15; M. Brudiu, M. Istrate, *Probleme noi în așezarea de la Mălușteni IV (jud. Vaslui)*, in *Materiale și cercetări arheologice*, Oradea, 1979, pp. 21–23; M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 207–211.

29. BEREȘTI. TOWN OF BEREȘTI, DISTRICT OF GALAȚI DEALUL TABEREI

History of Research

M. Brudiu discovered this settlement in 1969. It is situated on a northern side quest of Dealul Taberei hill. Near the summit of Dealul Taberei there is a rich network of phreatic waters; their origin is in a horizon of gravels attributed to Lower Holocene and known as „the gravels at Bălăbănești“.

Two other settlements were discovered several hundreds metres away, situation already encountered at Mălușteni and Dorohoi-Strachina.

Geological Stratigraphy

- dark grey vegetal soil, 0.25 m thick;
- brown-grey sandy transition layer, 0.10–0.12 m thick;
- light grey sandy layer, 0.35–0.40 m thick;
- basic reddish sandy-clayey soil.

Pedologically, the following horizons were identified:

- horizon A₁ dark-grey clayey sand, 0.25 m thick, representing the vegetal soil;
- horizon A₁'', grey-brown clayey sand, 0.25—0.35 m thick;
- horizon A₁'', light brown-grey sandy clay, 0.35—0.60 m thick;
- horizon B, light brown sandy clay with iron oxide infiltrations under the form of reddish-grey spots.

Archeological Stratigraphy

Two habitation levels were identified in the first place: one belonging to Tardenoisian (situated in horizon A₁'') and the other one attributed to Final Gravettian. The habitation level identified in the second place was also attributed to Final Gravettian and has the same stratigraphic position (the sandy clay deposit — horizon B).

Habitation Complexes

Lithic pieces and hearths were identified; the latter being destroyed by geological processes, isolated charcoals were found only. No faunal remains. The whole has an aspect of workshop — shelters.

Lithic Assemblages

The following types of microlithic tools were identified: 8 end scrapers (4 on blade-end and 4 on flakes), 5 Gravette points (2 with retouched truncated base), 4 „à bord abattu“ fragmentary bladelets, 4 crested blades, 1 simple blade with fine partial retouch on one or both sides, 2 blades with encoches, 4 exhausted nuclei, numerous unretouched blades and flakes and debitage waste.

Raw material: Prut silex, gritstone, black schist Audia and menilite.

Conclusion

The culture stratum was intensely affected by erosion which completely destroyed the hearths. Scarcity of lithic tools and their lack of diversification raise difficult cultural-chronological problems. The only clear element would be microlithization. This settlements might belong to Final Gravettian, but, in our opinion, it may be attributed to a later stage, i.e. Epigravettian, and dated to Early Holocene.

References

M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova*, București, 1971, pp. 102—104.

30. PLEȘA, COMMUNE OF BEREȘTI-MERIA, DISTRICT OF GALAȚI RÎPA MARÎȚEI

History of Research

This settlement, situated in the watershed between the valleys of Horia and that of the Jeravăț rivers, was discovered in 1968 by M. Brudiu. He carried out archeological research between 1968 and 1969.

Geological and Archeological Stratigraphy

Due to the geological phenomena frequent in and specific to the quest zones, the cultural stratification in the greater part of the settlement has almost been completely destroyed. Only in some small parts, the following deposits could be ascertained :

- vegetal soil, 0.20 m thick ;
- forest grey soil, 0.15 m thick ;
- brown soil with prismatic detachments, 0.40 m thick.

A single archeological stratum has been identified in the upper part of the brown soil and in the lower part of the forest grey soil.

Erosional processes have destroyed possible habitation surfaces and faunal remains.

Lithic Assemblage

Very few pieces have been discovered : end scrapers, burins (among which a flat one, on a nucleolated flake), blades and nuclei with one or two striking platforms.

Conclusions

The site is attributed to Final Gravettian phase, but we believe it should be included in the Epigravettian. From geochronology, this sporadic site could be dated to the beginning of the Holocene.

References

M. Brudiu, *Două descoperiri paleolitice în sudul Moldovei*, in *Danubius*, II—III, 1969, pp. 7—9 ; idem, *Așezările paleolitice gravetiene de la Puricani și Pleșa, județul Galați*, ibidem IV, 1970, pp. 4—8 ; idem, *Paleoliticul superior și epipaleoliticul din Moldova. Studiu arheologic*, București, 1973, p. 113.

31. PURICANI, COMMUNE OF BEREȘTI-MERIA, DISTRICT OF GALAȚI POARTA BIZANULUI

History of Research

M. Brudiu discovered this site in 1968. He excavated there between 1968 and 1970. It is situated at the highest point in the south of the Moldavian Plateau (280 m absolute altitude), near several sources of phreatic water.

Geological Stratigraphy

Due to erosional processes common in high relief zones, the chernozem vegetal soil was completely washed away. In this settlement, as in others occurring at the end of the Upper Paleolithic, the stratigraphic situation is as follows :

- dark grey vegetal soil, 0.20 m thick ;
- forest grey soil with fine granulation, 0.10 m thick (0.15—0.25 m) ;
- clayey-sandy soil with prismatic structure, 0.40 m thick ;
- at the base, sandy soil with infiltrations of ferrum oxides in the upper part.

From a pedological point of view, the following horizons were found :

- A (0.00—0.21 m), soil made of grey sandy clay ;
- A₂B (0.22—0.42 m), brown-yellow clayey-sandy clay with blue ash and prismatic detachments ;
- B₁ (0.42—0.65 m), brown-yellowish dusty-sandy clay with prismatic detachments ;
- B₂ (0.65—0.87 m), prismatic brown-yellowish dusty-sandy clay ;
- BD (0.88—1.10 m), clayey sand with pseudoveins and ferromagnetic accumulations, and fine grey sand at the base.

Archeological Stratigraphy

Both on the present-day surface of the soil and in boreholes agglomerations of lithic material were discovered. From the stratigraphic point of view they are situated between 0.20 and 0.45 m. that is on the A₂B horizon, considered to have been formed in Early Holocene.

Habitation Complexes

In the course of research, three habitation complexes were found. They are made up of lithic agglomerations and fragments of charcoal from hearths. A great quantity of debitage waste, some of which are calcined, is also specific to the workshops. Lack of faunal remains in a settlement dated to Early Holocene can be due to climatic changes which substantially altered the specific flora and fauna. They also led to the possible replacing of big herbivorous animals by small ones ; the latter's remains have not been preserved because of the soil conditions.

Lithic Assemblages

Since the three complexes are horizontally quite near to each other and belong to the same geological deposits, it is best to uniformly consider them as a lithic assemblage with no striking differences. They are :

<i>Tools :</i>	<i>Quantity :</i>	<i>Assemblage :</i>		
		I	II	III
— single end scrapers	8	(3	2	3)
— end scrapers on retouched blades	2	(1	1	—)
— double end scrapers	3	(1	1	1)
— end scrapers on flakes	10	(4	4	2)
— nucleolated end scrapers	3	(—	3	—)
— unguiform end scraper	1	(—	—	1)
— carinated end scraper	1	(—	—	1)
— end scraper-burins	7	(1	5	1)

Tools :**Quantity : Assemblage :**

		I	II	III
— perçoirs	4	(1	1	2)
— perçoir-burins	2	(1	1	—)
— dihedral burins	10	(6	3	1)
— angle burins	1	(1	—	—)
— angle burins on retouched truncation	5	(1	3	1)
— rabot-burins	1	(—	1	—)
— nucleolated burins	1	(—	—	1)
— Gravette points	3	(2	1	—)
— bladelets with „rounded edges“	13	(4	2	7)
— retouched blades	3	(2	—	1)
— Dufour bladelets	1	(—	1	—)
— Azilian point	1	(—	—	1)

To all these, 6 retouched flakes, 2 retouched blades, 56 unretouched blades, 6 crested blades, 16 nuclei, most of them prismatic with one or two striking platforms are to be added.

Raw material: Prut silex (84.50% in complex A and almost 100% in the other two), menilite (14.50% in complex A) and other Carpathian rocks (almost 1%).

Conclusions

This settlement is made up of several oval-shaped lithic workshops with a diameter of about 5.50×10.00 m.

M. Brudiu attributes these workshops to Final Gravettian and insists that they represent successive stages in time at small intervals from each other.

If they belong to the Tardiglacial period (on the basis of the period when horizon A₂B is believed to have been formed), also taking into account the marked microlithic character, we think that the three complexes can be attributed to Epigravettian and, by analogy with other similar settlements, they can be geochronologically dated to one of the pine phase stages.

References

M. Brudiu, *Două descoperiri paleolitice în județul Galați*, in *Danubius*, II—III, 1969, pp. 7—9; idem, *Așezările paleolitice gravettice de la Puricani și Pleșa*, ibidem, IV, 1970, pp. 3—8; idem, *Cercetări paleolitice la Puricani, județul Galați (1970)*, in *Materiale*, X, 1973, pp. 15—18; idem, *Paleoliticul superior și epipaleoliticul din Moldova. Studiu arheologic*, București, 1973, pp. 113—117.

32. ȚEPU, COMMUNE OF ȚEPU, DISTRICT OF GALAȚI GÎRNEAȚĂ

History of Research

The settlement, situated on the middle terrace of the Berheci river, was discovered by M. Brudiu. It was excavated by him by sondages in 1976. It had largely been destroyed by the vineyard plantation.

Geological and Archeological Stratigraphy

- vegetal blended soil due to tillings for vineyard planting where the archeological material was identified, 0.40 m thick (0.00–0.40 m) ;
- yellow gleysed soil with calcareous concretions, archeologically sterile, 0.60 m thick (0.40–1.00 m) ;
- ground-water layer belonging to the gravel and soliflucted sand deposits in the Lower Pleistocene in the base, at a depth of about 1.50 m.

Because of the lack of habitation complexes (hearths and lithic workshop included) and faunal remains, this settlement is considered to have a seasonal character.

Lithic Assemblage

Quite a few lithic pieces were discovered as the culture stratum has been destroyed and research had a limited character.

The following types of tools were identified : single end scrapers, end scrapers on flakes, nucleolated end scrapers, 1 end scraper-burin and 1 perçoir-end scraper, burins of various types (polyhedral, multiple mixed, angle on truncation ones), 1 perçoir, retouched blades, 1 crested blade and about 40 unretouched flakes.

The whole lithic inventory has a macrolithic character. Raw material : Middle Prut silex, silicified gritstone with galuconite and jasper with radiolars.

Conclusions

On the basis of the features of lithic inventory this settlement may belong to an evolved Gravettian stage. From geochronology it should be dated to a period of a climatic oscillation following Würm₃ stade, i.e. the Tardiglacial.

References

M. Brudiu, *Cercetări paleolitice la Țepu, județul Galați*, in *Memoria Antiquitatis*, IX–XI (1977–1979), 1985, pp. 304–310.

33. CAVADINEȘTI, COMMUNE OF CAVADINEȘTI, DISTRICT OF GALAȚI RÎPA PLOPIILOR

History of Research

During a field survey carried out in the south of the Moldavian Plateau, M. Brudiu discovered this site in 1968. It was situated on the crest of Drumul Galașilor hill at an altitude of about 300 m. Limited excavations were performed in 1969.

Geological and Archeological Stratigraphy

At the surface, tillable soil is sandy, the chernozem having been washed away by erosion processes. A yellow-reddish sandy loess follows.

The lithic material was identified in the tillable layer which is grey and sandy, the culture stratum being wholly destroyed by farming activities.

Lithic Assemblage

The following tools were identified: 1 Gravette point, 1 blade with "rounded edge", angle burins on retouched truncation, dihedral ones, single end scrapers, retouched and unretouched blades, macrolithic flakes, prismatic or irregular nuclei.

Conclusions

The concentrations of lithic material in a somewhat oval area would allow us to identify a lithic workshop — shelter. Its being attributed to a Final Gravettian stage could be correct and in correspondence with the features of the settlement.

References

M. Brudiu, *Așezarea gravettiană de la Cavadinești (jud. Galați)*, in *Rev. Muz.*, VII, 1970, 6, pp. 525–526; idem, *Paleoliticul superior și epipaleoliticul din Moldova*, Buc., 1974, pp. 104–105.

34. SUCEVENI, COMMUNE OF SUCEVENI, DISTRICT OF GALAȚI CĂTĂRĂU

History of Research

The settlement is situated on the highest elevation point of the Drumul Galaților hill, in the vicinity of a crest and of a perennial spring. It was discovered and investigated by M. Brudiu in 1971–1973.

Geological Stratigraphy

- vegetal soil, 0.30 m thick ;
- grey-black soil, 0.20 m thick ;
- brown soil belonging to Holocene, 0.20 m thick ;
- reddish-brown soil belonging to late Upper Pleistocene sterile from archeological and faunistical points of view.

Archeological Stratigraphy

A single habitation level was identified in the brown soil. No habitation complexes. Slight traces of lithic workshops.

Lithic Assemblage

Much debitage waste. The following tools were identified: 2 Dufour bladelets, 2 end scrapers on blade and 1 on an exhausted nucleus (atypical robot), 4 atypical "à bord abattu" bladelets, a medium polyhedral burin on

flake and 1 medium dihedral one, 2 burin-end scrapers, 1 perçoir, 1 fragmentary blade with oblique retouch on the right side, 5 exhausted nuclei and untouched blades.

In the category of "other discoveries" we mention some hematite fragments probably used for dyeing.

Conclusions

The sporadic character of this settlement, the lack of habitation complexes, hearths included (although some isolated fragmentary charcoals were found), the scarcity of lithic inventory do not allow a precise geochronological framing in the diagram of Final Gravettian. The presence of Prut silex in high proportion and its utilization up to debitage waste products exhaustion might indicate a farther area of Middle Prut zone. As this settlement is situated in a soil belonging to Holocene and due to the frequency of microlithic and atypical pieces, the site could belong to one of the last Epigravettian stages preceding Epipaleolithic period.

References

M. Brudiu, *Cercetări paleolitice la Suceveni (județul Galați)*, in *Danubius*, VI-VII, 1972-1974, pp. 7-12.

35. MOSCU, TOWN OF TÎRGU BUJOR, DISTRICT OF GALAȚI RÎPA DETUNATA

History of Research

This settlement, situated in a cuesta zone in the south of the Moldavian Plateau, in the Chineja river valley, was discovered and excavated by M. Brudiu in 1973. Like that at Suceveni — Catărău, the settlement at Moscu lies on a high plateau, near a perennial spring made up of the ground-water layer of some Villafranchian deposits.

Geological and Archeological Stratigraphy

- vegetal soil, 0.25 m thick ;
- sandy yellow-reddish soil which contains an Epigravettian cultural level at a depth of 0.30-0.50 m. Ploughing disturbed the culture stratum, bringing to the surface lithic material.

Habitation Complexes

No hearths have been identified, but fragments of charcoal point to their former existence. Similarly, the agglomerations of lithic pieces are proofs of the existence of some dwelling (huts on the soil surface with seasonal character).

Palaeofauna

Only a few bovine molars in poor preservation state (due to soil conditions) were found. Geological processes destroyed the transition soil between the yellow-reddish horizon and the vegetal stratum and influenced faunal remains.

Lithic Assemblage

The following tools were identified :

- 8 single end scrapers on flakes or exhausted nuclei (rabots) ;
- 11 burins on retouched truncation and angle on a break ;
- 3 perçoirs on microlithic flakes ;
- 1 Gravette point ;
- 2 pieces with retouched truncations ;
- 1 Gravette point with retouch on the flat side ;
- numerous unretouched blades, some crested ones, others with utilization retouch ;
- prismatic nuclei, with one or two striking platforms.

Conclusions

The presence of Prut silex as raw material proves the filiation of this settlement. To this element we can add the Gravette point with retouch on the flat side identified, as M. Brudiu precises, not only here but at Stinca-Ripiceni, Ripiceni-Valea Badelui and Valea Ursului, as well. Its origin can be placed either in the Middle Prut area or in that of the Dniester. The dating of east-Carpathian sites during the Herculane I (Tursac) climatic oscillation based on such Gravette points found at Molodova V (dated to $23,300 \pm 320$ B.P.) is too early. The site at Ripiceni-Valea Badelui was attributed to Românești (Lascaux) climatic oscillation and its dating (about 17,000 B.P.) might be nearer to the real period of its being inhabited.

Moreover, the features specific to the lithic inventory at Moscu gives this site more recent characteristics, so that it might have been contemporary with the Bölling oscillation, when level 3 at Molodova on the Dniester ($13,370 \pm 540$ B.P.) was dated to.

References

M. Brudiu, *Așezarea paleolitică de la Moscu (jud. Galați) și unele considerații asupra paleoliticului târziu din Moldova*, in *Danubius*, X, 1981, pp. 13–22.

The Characteristics of Gravettian Habitations

A pertaining characterization of the habitations during the second cultural stage of the Upper Paleolithic is rendered difficult mostly by the features specific to each of the settlements :

- a) the relief form on which it is situated ;
- b) the different way of sedimenting of every relief form or according to the geographic zone which the respective station belongs to ;
- c) the extension of the excavated area ;
- d) the importance given to each habitation complex and to its strict delimitation ;
- e) the correct and detailed study of palaeofaunal remains ;
- f) the existence of certain interdisciplinary investigations and their scientific turning to account ;
- g) the strict co-ordination between archeological and geological stratigraphies ;
- h) *the lack* of a unique European typology and of a glossary of terms to be used by all specialists ;
- i) the specific conditions of environment in which *the same* strictly contemporary human communities could have followed different ways in order to adapt themselves to the realities of the natural background ;
- j) the use of such a varied range of raw materials with various consequences upon the quality and the proportion of finished products ;
- k) the various peculiarities of each community in achieving the same types of finished pieces etc.

The synthesis studies published in Europe so far¹ have to a small extent evidenced all the above co-ordinates or some further ones, being limited in many cases to the identification of similarities and differences between synchronic or non-synchronic cultural levels, both on the basis of literature,

¹ C. Gamble, *The Paleolithic Settlement of Europe*, Cambridge, 1986 ; Desmond Collins, *Palaeolithic Europe*, Devon, 1986 ; D.K. Bhattacharya, *Palaeolithic Europe*, Oosterhout, 1977 ; P. Allsworth-Jones, *The Szeletian and the Transition from Middle to Upper Palaeolithic in Central Europe*, Oxford, 1986 ; O. Soffer, *The Upper Palaeolithic of the Central Russian Plain*, Academic Press, 1985.

that is of the papers published by the authors of researches, and on personal studies of certain inventories, not always and not wholly placed at disposal by the authors of the respective research, and without *minutely* knowing all the elements conferring a greater or smaller degree of uniqueness to a habitation or a cultural level. There might also appear confusions if one gives too much importance to certain interdisciplinary studies such as palynology, C-14 results etc., without their being judiciously analysed in correlation to the lithic inventories and the other elements of strictly archeological character.

As for the study of the Gravettian in Romania's East-Carpathian region where several geographic zones, with their own specific character regarding the appearance and evolution of Gravettian stages², have been delimited, there are several aspects, of great importance, that have necessarily to be clarified :

1. The completion of excavations in the large site, at Mitoc-Malul Galben and the elaboration of some pertinent interdisciplinary studies in order to correctly assess archeological stratigraphy and intense geological phenomena so that the C-14 datings be interpreted, and the *real* Gravettian habitation levels be precisely established.

2. The exhaustive publishing of the Gravettian in the large site, at Ripiceni-Izvor which, together with the discoveries at Malul Galben-Mitoc, will become the „key” in understanding this culture in Southeast and East Europe.

3. The geochronological and cultural reevaluation of the Gravettian levels on the Bistrița River terrace system (Ceahlău zone) and their correlation with those on the Prut River terraces in order to establish the phenomena of connexion and interdependence.

4. The extension of researches in the habitations situated south of the Moldavian Plateau in order to more exactly define local Epigravettian.

5. Romanian specialists' admittance to directly and immediately consult, the materials in Central and East Europe in order to correlate discoveries in these zones with those in Romania and more exactly establish the polyphyletic origin of the Gravettian Technocomplex.

Attempting a still hypothetic systematization of Gravettian discoveries in the geographical space under study, we shall find certain similarities between various complexes, irrespective of geographical micro-zone and relief forms.

Thus, as for the raw material, if in the habitations on the Prut River local silex amounts to almost 100%, there are also pieces made of rocks of various origin: quartzite at Stînca-Ripiceni, levels I and V³, as well as certain finished products made of gritstone at Mitoc-Malul Galben, level II, and at Mitoc-Pîriul lui Istrati, level II. All these could come from the gritstone deposits at Ivancăuți (district of Botoșani), but also as a result of some human communities having moved from the terraces of the Bistrița River to those of the Prut River. In the habitations situated on the Suceava

² V. Chirica, *Le Paléolithique supérieur et final au Nord du Bas Danube*, in *Actes du XII-e Congrès UISPP*, Mainz, 1987.

³ N. N. Moroșan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est*, in *Anuarul Institutului Geologic al României*, XIX, 1948, pp. 8 sq.; idem, *La station paléolithique de grotte de Stînca-Ripiceni*, in *Dacia*, V—VI (1935—1936), pp. 1—22.

Plateau and south of the Moldavian Plateau the preponderance of Prut silex can be explained by human communities' benefiting from the rich ore along the lower bed of the Prut River. On the Suceava Plateau especially we can find a varied range of raw materials, some of them of Carpathian origin, whose source is explained scientifically in various studies. At Topile-Dealul Catargii, the Prut silex amounts to 82.56 %⁴, at Udești-Poiana to 76 %⁵, and at Dolhasca-Dealul Viei to 78 %⁶. Movileni-Heleșteni is the only site where silex is second (23 %⁷) to menilite (51 %). At Lespezi-Lutărie⁸, this proportion of silex and Carpathian rocks differs from a level to another: on levels VI and V, silex amounts to 13%, and gritstone to 61 %; on levels IV and II, silex and menilite were used in equal proportions (35 % and 34 %), and on level III menilite amounts to 54 %, and silex to only 9 %. These variations of percentage could result from periodical migrations of human groups to the Middle Prut zone, either while hunting or in order to increase their provisions of best quality raw material. In fact, even in the settlements or in the habitation levels where percentages of silex are lower than those of other rocks, this material has been used in achieving the finest products: the pieces of Gravette type and Dufour blades. A situation similar to that at Lespezi can be found on the Bistrița River terrace system: Izvorul Alb and Bicz-Ciungi where menilite pieces have the highest percentage (about 80 %), but silex usage amounts to only 10 %⁹. The same differentiated situation is to be found in the Ceahlău area, as well: Bistricioara-Lutărie (level III: silex — 55 %, menilite — 25 %; level IV: silex — 62 %, menilite — 30 %; levels V—VI: menilite — 56 %, silex — 36 %); at Bofu Mic (menilite — 28 %, silex — 10 %); at Cetățica I (level II: silex — 50 %, menilite — 33 %; level III: silex — 62 %, menilite — 27.40 %; level IV: silex — 47.20 %, menilite — 30.60 %); at Cremenish (menilite — 85 %, silex — only 4 %); at Podiș (level II: menilite — 70.20 %, silex — 19 %; level III: menilite — 50 %, silex — 42 %; level IV: menilite — 55 %, silex — 35 %; level V: menilite — 45.40 %, silex — 42.60 %) ¹⁰. From this brief statistics there results a certain periodicity in human groups' migration on the terraces of the Prut River in search for raw material. On the other hand, in certain stages of Upper Pleistocene, when the living conditions in the Prut zone became inadequate to habitations, one can also admit of the migrations of human communities from the terraces of the Prut River

⁴ Al. Păunescu, *Locuiri gravelliene de la Valea Seacă (jud. Iași) și unele considerații asupra Gravettianului oriental final din Moldova*, in *SCIV*, XXI, 1970, 4, pp. 539—549.

⁵ M. Bitiri, *Așezarea paleolitică de la Udești și specificul ei cultural*, in *SCIVA*, 32, 1981, 3, pp. 331—345.

⁶ V. Chirica, M. Tanasache, *Cercetări arheologice în așezarea de la Dolhasca (jud. Suceava) și unele considerații privind Gravettianul de pe teritoriul României*, in *Memoria Antiquitalis*, VI—VII (1974—1976), 1981, pp. 267—290.

⁷ Al. Păunescu, *Cercetări paleolitice*, in *SCIV*, 17, 1966, 2, pp. 327—329; V. Chirica, M. Tanasache, *Repertoriul arheologic al județului Iași*, vol. I, Iași, 1983, p. 169.

⁸ M. Bitiri, V. Căpitanu, *Așezarea paleolitică de la Lespezi, județul Bacău*, in *Carpica* 1972, pp. 39—68.

⁹ Fl. Mogoșanu, M. Matei, *Noi cercetări paleolitice în zona Bicz*, in *SCIVA*, 32, 1981, 3, pp. 413—421; idem, *Noi cercetări și săpături arheologice în așezările paleolitice de la Izvorul Alb—Bicz*, in *SCIVA*, 34, 1984, 3, pp. 243—248; M. Brudiu, *Paleoliticul superior și epipaleoliticul din Moldova. Studiu arheologic*, București, 1974, pp. 77—78.

¹⁰ C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *Le Paléolithique de Ceahlău*, in *Dacia*, N.S., X, 1966, pp. 5—105.

to those of the Bistrița River. Moreover, as far as we can admit that every culture stratum in the two hydrographic basins represents a unique real level of geochronological habitation, it will be possible to establish direct relationships of technological, cultural and chronological order. In the present stage of research, we cannot be very sure if a higher proportion of menilite (in certain stratigraphic levels) or of Prut silex (in others, in the same station) can attribute them to certain distinct stages in the evolution of Gravettian culture, or to the directions of migration from a geographical area to another.

The analysis of the prevalence of certain types of tools facilitates the identification of certain technical cultural groups. From this point of view, by evaluating the end scraper-burins proportion, it is the site at Cotu Miculinți¹¹ that makes itself conspicuous, where, maybe due to a certain specialization in processing antlers and reindeer horns, burins have a distinct superiority over end scrapers (101/31 in level II and 176/71 in level III). As regards the burins, it is to be noticed that they can be taken into consideration both from the technico-typological view point and from the utilitarian one.

In all the other settlements or habitation levels where a rich lithic inventory is to be found the number of end scrapers (with all their range of variants) is higher than that of burins: 74/11 at Mitoc-Valea lui Stan, 105/26 at Mălușteni III¹², 79/2 at Udești-Poiana¹³, 90/65 at Dorohoi-Strachina¹⁴ 57/28 at Dolhasca-Dealul Viei¹⁵, whereas in other sites the proportions are quite equal or less marked: 59/59 at Topile-Dealul Catargii¹⁶, 64/53 at Buda-Dealul Viei¹⁷. It is obvious that we cannot overlook the typological and qualitative differences between the single end scrapers and those on flakes, some of them bulky, similar to raclettes, or carinated, others microlithic, single or on flake, often circular or unguiform specific to the Epigravettian in the south of the Moldavian Plateau. In the same context, we must show that, although being reported to superior evolu-

¹¹ M. Brudiu, *Rezultatele cercetărilor arheologice din stațiunea paleolitică de la Cotu Miculinți, com. Coșușca (jud. Botoșani)*, in *Materiale și cercetări arheologice*, Oradea, 1979, pp. 7–16; idem, *Cercetări arheologice în stațiunea paleolitică de la Cotu Miculinți, jud. Botoșani*, in *Materiale și cercetări arheologice*, Tulcea, 1981, pp. 5–11; idem, *Săpăturile arheologice de la Cotu Miculinți*, in *Materiale și cercetări arheologice*, Vaslui, 1982, București, 1986, pp. 5–8.

¹² M. Brudiu, *op. cit.*, 1974, pp. 105–112; M. Brudiu, Eug. Popușoi, *Rezultatele cercetărilor paleolitice de la Mălușteni, jud. Vaslui (1969–1971)*, in *Danubius*, VIII–IX, 1979, pp. 7–15.

¹³ M. Bîțiri, *op. cit.*, pp. 331–345.

¹⁴ Al. Păunescu, Gh. M. Vasiliu, *Noi descoperiri paleolitice în regiunea Suceava*, in *Revista muzeelor*, IV, 1967, 1, pp. 364–366; Al. Păunescu, *O nouă așezare gravettian-orientală în nordul Moldovei*, in *SCIV*, 19, 1968, 1, pp. 31–39; idem, *Evoluția uneltelor și armelor de piatră cioplită descoperite pe teritoriul Rorâniei*, București, 1970, pp. 132–134; Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, București, 1976, pp. 250–251.

¹⁵ V. Chirica, M. Tanasache, *op. cit.*, 1981, pp. 267–290.

¹⁶ Al. Păunescu, *op. cit.*, in *SCIV*, 21, 1970, 3, pp. 539–549; V. Chirica, M. Tanasache, *op. cit.*, vol. II, 1985, p. 442.

¹⁷ C. S. Nicolăescu-Plopșor, V. Căpitanu, V. Ursachi, C. Buzdugan, *Cercetările și săpăturile arheologice de la Buda*, in *Materiale*, VII, 1961, pp. 21–25; V. Căpitanu, C. Buzdugan, V. Ursachi, *Săpăturile arheologice de la Buda*, in *Materiale*, VIII, 1962, pp. 141–144; V. Căpitanu, *Așezarea paleolitică de la Buda-Blăgești*, in *Revista Muzeelor*, IV, 1967, 4, pp. 267–271; Al. Păunescu, *op. cit.*, 1970, p. 129.

tive stages of Gravettian culture, the first levels at Cotu Miculinți and Crasnaleuca¹⁸ are characterized by a marked archaic feature of lithic inventory certified by the rather high number of rabots and raclettes (a situation encountered in other habitations on the Suceava Plateau, as well).

Some cultural associations can also be made due to the presence of various categories of finished tools which are seldom found. Thus, due to the presence of Azilian type points with one of their sides arched and retouched, one can notice certain technico-typological analogies between the lithic inventories at Mălușteni III¹⁹, Puricani²⁰, Dorohoi²¹ and those at Dirțu-level V, Bofu Mic-level II, Podiș-level III²², Ripiceni-Izvor and Bistricioara-Lutărie (level VI). As some specialists admit that the presence of this type of pieces proves a late (Magdalenoid²³) Central European influence, we may place the respective habitations and levels toward the end of Gravettian or even in Epi-gravettian. These habitations would therefore make up a distinct group within the Romanian Gravettian.

Another distinct group is made up of the settlements and habitation levels where there have been found Gravette points with retouch on the ventral face: Ripiceni-Valea Badelui²⁴, Stîncă-Ripiceni (level VII)²⁵, Valea Ursului²⁶, Moscu²⁷, Topile²⁸, Cetățica I (level II)²⁹, Mitoc-Malul Galben (level IV), with analogies to Climente I-Dubova³⁰ or in the Prut-Dniester area³¹. From this point of view we think that the attempts to establish the Eastern origin of Romanian Gravettian based on the presence of this type of finished product are not supported by certain scientific arguments, given the presence of Gravette points with retouch on the ventral face in some stations of a large Mediterranean area.

The presence of the pieces of "atypical shouldered point" type in the habitations at Stîncă-Ripiceni (level V)³², Lespezi (levels V–VI)³³, Buda³⁴,

¹⁸ Cf. [11]: M. Brudiu, *Date noi privind cultura Gravettianului oriental din Moldova rezultate din cercelările de la Crasnaleuca, jud. Botoșani*, în *Hierasus. Anuar* '78, I, 1979, pp. 77–91; idem, *Descoperirile paleolitice de la Crasnaleuca, con. Coșușca, jud. Botoșani*, în *SCIVA*, 21, 1980, 4, pp. 425–444.

¹⁹ Cf. [12].

²⁰ M. Brudiu, *op. cit.*, 1974, pp. 113–117.

²¹ Cf. [14].

²² C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *op. cit.*, pp. 5–105.

²³ Al. Păunescu, *op. cit.*, 1970, p. 134.

²⁴ Al. Păunescu, *Cercelări arheologice în județul Botoșani (1970)*, în *Materiale*, X, 1973, pp. 10–13.

²⁵ N. N. Moroșan, *Le Pléistocène et le Paléolithique de la Roumanie du Nord-Est*, în *Anuarul Institutului Geologic al României*, XIX, 1938, pp. 9–29; idem, *La station paléolithique de grotte de Stîncă-Ripiceni*, în *Dacia*, V–VI (1935–1936), pp. 1–22.

²⁶ M. Brudiu, *op. cit.*, 1974, pp. 122–124.

²⁷ M. Brudiu, *Așezarea paleolitică de la Moscu (jud. Galați) și unele considerații asupra paleoliticului târziu din Moldova*, în *Danubius*, X, 1981, pp. 13–22.

²⁸ Al. Păunescu, *op. cit.*, în *SCIV*, 21, 1970, 4, pp. 539–549.

²⁹ C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *op. cit.*, pp. 5–105.

³⁰ V. Boroneanț, *Descoperiri gravettiene în peștera lui Climente*, în *Revista muzeelor*, V, 1968, 6, pp. 542–546.

³¹ M. Brudiu, *op. cit.*, 1981, p. 322.

³² Cf. [25].

³³ M. Bitiri, V. Căpitanu, *op. cit.*, pp. 39–68.

³⁴ Cf. [17].

Udești³⁵, Valea Ursului³⁶, Bistricioara-Lutărie (level VI)³⁷ and Bofu Mic (level II)³⁸ has a double significance. First of all, these settlements make up a distinct group in the East Carpathian Gravettian; on the other hand, only a few specialists mention this piece to evidence the Eastern origin of Romanian Gravettian³⁹. In our opinion, this type of piece, having an atypical character in all the habitations where it has been identified, could be either accidental or an echo in time of certain possible Eastern influences. It is to be noticed that in no other site on the Prut River have such pieces been found, and the Eastern influences in the Suceava Plateau or the peri-Carpathian area could not come otherwise but by means of the habitations on the Prut, taking into consideration the presence of Buglovian silex (at the base of the river's lower terraces), sometimes in higher proportions, in all the above mentioned habitations.

Another group of Gravettian habitations is determined by the inventories in which Dufour bladelets were identified: Mălușteni IV—V⁴⁰, Mitoc-Malul Galben (level II), Puricani⁴¹, Suceveni⁴², Lespezi⁴³, Ripiceni-Izvor and Topile. As we have already shown⁴⁴, these pieces are commonly found in Aurignacian habitations in the Banat, being of a doubtless Central European origin⁴⁵. Their presence in the East Carpathian Gravettian could mean they are intermediate landmarks toward certain sites in the Prut-Dniester area, indicating the west to east direction of influences and not the reverse.

Without determining a distinct group, we shall mention the presence of "point" type blades at Stinca-Ripiceni (level III)⁴⁶ and at Malul Galben-Mitoc (level IV).

On the basis of types of tools with double function one can identify other cultural-technological groups reported to the Gravettian on the whole territory of Romania:

a) the end scraper-burins are mentioned in many sites, among which Ripiceni-Izvor, Mitoc (all the sites), Boinești, Buda, Dorohoi, Topile, Valea Ursului, Bofu Mic, Crasnaleuca, Puricani and Suceveni;

b) percoir-end scrapers: Ripiceni-Izvor, Mălușteni, Boinești, Remetea Somoș I (all these habitation levels being attributed to Final Gravettian);

³⁵ M. Bitiri, *op. cit.*, 1981, pp. 331—345.

³⁶ M. Brudiu, *op. cit.*, 1974, pp. 122—121.

³⁷ C. S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *op. cit.*, pp. 5—105.

³⁸ *Ibidem*.

³⁹ M. Bitiri-Ciortescu, *Complexes lithiques avec pointes à cran de Roumanie et leurs relations avec la culture Kostienki-Avdeevo*, in *Actes du Coll. de Liège „La signification culturelle des industries lithiques“*, BAR, Int. Series, 239, 1985, pp. 139—148.

⁴⁰ Cf. [12].

⁴¹ M. Brudiu, *op. cit.*, 1974, pp. 113—117.

⁴² Idem, *Cercetări paleolitice la Suceveni (județul Galați)*, in *Danubius*, VI—VII, 1972—1973, pp. 7—12.

⁴³ M. Bitiri, V. Căpitanu, *op. cit.*, pp. 39—68.

⁴⁴ V. Chirica, *Considerații cu privire la paleoliticul final de pe teritoriul României*, in *Cercetări istorice*, SN, VIII, Iași, 1977, pp. 109—124; idem, *Unele probleme privind paleoliticul superior la est de Carpați*, in *Hierasus. Anuar '83*, V, 1985, pp. 7—36.

⁴⁵ Fl. Mogoșanu, *Paleoliticul din Banat*, București, 1978.

⁴⁶ Cf. [25].

c) perçoir-burins, identified at Dorohoi, Dolhasca, Lespezi and Puricani (in strata belonging to the same final stage of culture).

Perçoirs are also commonly found in final Gravettian habitations in habitation levels at Ripiceni-Izvor, Dolhasca, Dorohoi, Topile, Movileni, Lespezi (in almost all levels), Buda, Dîrțu, Podiș, Bofu Mic, Remetea Somoș (level III), Boinești (level III), but in some levels stratigraphically attributed to Lower Gravettian, as well: Bistricioara-Lutărie and Călinești I.

Bifacial pieces have been identified only at Ripiceni-Izvor and Dolhasca.

Objects made of bones and horns have been discovered at Crasnaleuca, Cotu Miculinți, Stîncă-Ripiceni (levels III and IV), Mitoc-Malul Galben, Climente I-Dubova.

We also think it necessary to mention the presence of pieces of art and adornment, at Mitoc-Malul Galben, Crasnaleuca, Stîncă-Ripiceni and Gura Cheii-Rîșnov. We are referring to the pendant-amulet at Mitoc, to the centrally perforated small round discs at Crasnaleuca and to the animal teeth, some of which also completely perforated or with traces of unfinished perforation, at Gura Cheii-Rîșnov and Stîncă-Ripiceni.

Finally, other cultural-technological groups could be established through the identification and proportion or absence of blades and bladelets with either "rounded edge" and of Gravette points. First of all, we shall notice the absence of these pieces at Mitoc-Valea lui Stan⁴⁷, Cotu Miculinți⁴⁸, Piatra Neamț-Poiana Ciresului⁴⁹, Curteni⁵⁰, Lespezi (level VI)⁵¹ and Mălușteni III⁵², whereas only blades and bladelets with "rounded edge", but no Gravette points⁵³ were found at Dolhasca, and only 1—2 Gravette points but no other pieces with "rounded edge" at Ghireni⁵⁴ and Crasnaleuca⁵⁵. If we go on analysing the ratio of blades with "rounded edge" and Gravette points, we find 91/29 at Buda⁵⁶, 106/18 at Dorohoi⁵⁷, 56/6 at Udești⁵⁸, 141/56 at Dîrțu (level V)⁵⁹, 77/53 at Bofu Mic (level II)⁶⁰.

These technical-typological cultural groups could be supplemented with others, established on the basis of the analysis of habitation complexes: specific disposition of constructions, hearths and lithic workshops. A third category of assemblages could also be established on geographical criteria and on the forms of relief the human communities' sites are placed on. These two categories can be associated, although there are also outstan-

⁴⁷ Cercetări V. Chirica, M. Istrati, 1977.

⁴⁸ Cf. [11].

⁴⁹ V. Căpitanu, *Descoperiri paleolitice în județele Neamț și Vaslui*, în *Carpica*, II, 1969, pp. 7—11.

⁵⁰ *Ibidem*, pp. 13—15.

⁵¹ M. Bitiri, V. Căpitanu, *op. cit.*, pp. 39—68.

⁵² M. Brudiu, *op. cit.*, 1974, pp. 105—112.

⁵³ V. Chirica, M. Tanasachi, *op. cit.*, 1981, pp. 267—290.

⁵⁴ Al. Păunescu, *Cercetări paleolitice în județul Botoșani. (1970)*, în *Materiale*, X, 1973, pp. 9—10.

⁵⁵ Cf. [18].

⁵⁶ Cf. [17].

⁵⁷ Cf. [14].

⁵⁸ M. Bitiri, *op. cit.*, 1981, pp. 331—345.

⁵⁹ C.S. Nicolăescu-Plopșor, Al. Păunescu, Fl. Mogoșanu, *op. cit.*, p. 5—105.

⁶⁰ *Ibidem*.

ding differences. Thus, the group of habitations on the Middle Prut are characterized by an association of elements in the second and third categories, geographically making up a distinct group which does not lack in habitation complexes situated mostly on the terraces of the most important river that drained the Moldavian Plateau during Pliocene and Pleistocene. Certain site in this area are characterized by complete and well stratified profiles, both geologically and archeologically.

A second geographical group, within which the elements of the previous two categories are also associated, is made up of the sites on the Bistrița terraces, both in the Ceahlău zone and downstream: Bicaz, Piatra Neam!, Buda and Lespezi. These habitations are also characterized by a great number of archeological levels (even if they do not always represent distinct geochronological stages) with important habitation complexes (shelters, hearths and workshops in which the local rocks were processed), having in addition direct and almost permanent links with the entire assemblage of the habitations on the Middle Prut.

The third cultural and geographical group is represented by the sites on the Suceava Plateau, most of which lack in habitation complexes but possess very rich and varied lithic inventories as compared with certain sites on the Prut (Mitoc-Valea lui Stan and Mitoc-Malul Galben in the present stage of research).

Finally, the fourth regional group is made up of sites in the south of the Moldavian Plateau, most of which are represented by temporary campments with few habitation complexes but less diversified lithic inventories, presenting doubtless relationships with the geographical zone of the Middle Prut even if only through the predominant presence of Buglovian silex.

We did not try to identify direct relationships with other groups of sites either in other geographical zones of Romania's territory or in neighbouring or farther regions as we did not intend to reveal analogies without a real archeological and historical support. In this respect, we could, for instance, mention that „shouldered“ pieces, Dufour bladelets or points with retouch on the ventral face are encountered in other lithic inventories in Central and Western Europe as well, but we don't have yet enough proofs to doubtlessly establish the filiation of certain types of pieces we found in the lithic complexes in the East Carpathian space, in the east, west or central-European technical-typological and cultural sites or complexes. We have only attempted to define certain cultural groups specific to the east-Carpathian Gravettian, which is known on a south east and east-European large area.

In spite of all this, certain considerations are still to be made concerning the characteristics of those habitation levels whose features have been minutely investigated.

Palaeofauna

The fauna discovered in Gravettian habitations represents the following species: *Equus caballus*, *Bos s. Bison*, *Bison priscus*, *Bos primigenius*, *Rangifer tarandus*, *Alces alces*, *Rhinoceros tichorhinus*, *Coelodonta*

antiquitalis. A veritable ossuary was discovered at Buda-Dealul Vici⁶¹ and in Climente's cave (Iron Gates zone) where bones of *Ursus spelaeus*, *Ursus arctos*, *Canis lupus*, *Felis* (?), *Mustela* (?), *Rupicapra rupicapra*, *Bos s. Bison* were found. Fragments of *Ursus* and *Felis* were also discovered in the habitations at Mitoc-Malul Galben. However, in a quite great number of habitations, absolutely no palaeofaunal remains were found: Udești, Dolhasca, Topile, Movileni, Bofu Mic (level II), Dîrțu (level V), Cetățica I, Cremenis I and II, etc. As Al. Bolomey⁶² showed, it is difficult to admit the migration or disappearance of the mammals belonging to Upper Pleistocene, since remains of these are found in other contemporary or subsequent habitations. The absence of faunal elements in the sites and habitation levels mentioned above or in those in the south of the Moldavian Plateau must be attributed to the very short (seasonal) duration of human groups' camping in a place. Nor should one overlook the chemical characteristics of certain geological sediments, whose solidity contributed to weathering the palaeofauna. It is striking that level II at Bofu Mic and level V at Dîrțu, for instance, represent the richest habitations in the whole area of the Bistrița terraces (taking as reference point the richness and variety of lithic tools), but they both lack in palaeofaunal remains.

The presence of warm climate species (*Felis leo spelaea* at Mitoc, Climente's cave and Stîncea-Ripiceni) could reveal the existence of some climatic periods much ameliorated in comparison with the general conditions of the final stage of Upper Pleistocene. The existence of reindeer at Crasna-leuca, Cotu Miculinți, Ripiceni-Stîncea, Ripiceni-Valea Badelui, Bistrițioara-Lutărie (level III), Poiana Cireșului, Buda, Lespezi, sometimes associated with *Rhinoceros tichorhinus*, at Mitoc-Malul Galben and Pîriul lui Istrati, represented by rich bone remains, enable us to include the respective habitation levels in a periglacial climate, immediately prior or subsequent to the last Würmian stage. The using of certain remains (especially dentition) to make adornment pieces could also suggest the existence of elements of hunting witchcraft (Ripiceni-Stîncea, Gura Cheii-Rîșnov). Most of the palaeofaunal remains belong to *Equus sp.* and *Bos s. Bison*, the favourite game of human groups on large continental areas, species readily adaptable to changes of climate, found either in isolation (in periods of climatic amelioration) or associated with *Rangifer* and *Rhinoceros* (in cold periods).

Lithic Assemblages

As regards lithic tools, although we have tried to show the existence of several groups of settlements or habitation levels based on the identification of seldom found pieces (shouldered points, some of which were Perigordian, at Ripiceni-Izvor, Dufour bladelets, points with retouch on the ventral face, Azilian points, microlithic crescent-shaped pieces, etc.) we shall notice that each lithic inventory has its own individuality, so that a systema-

⁶¹ O. Necrasov, M. Bulai-Știrbu, *Contribuții la studiul faunei pleistocene de la Buda (jud. Bacău) cu privire specială asupra renului*, in *Carpica*, 1971, pp. 7—19.

⁶² Vl. Dumitrescu, Al. Bolomey, P. Mogoșanu, *Esquisse d'une préhistoire de la Roumanie*, București, 1983, pp. 23—24.

lization of Gravettian groups is still uncertain. We are referring to disagreements between the geochronological age assumed for each habitation or habitation level, and their cultural-technological characteristics. Thus, the archaic features noticed in almost all habitation levels at Crasnaleuca and Cotu Miculinți, or at Mitoc-Valea lui Stan (where the pieces with round edge and the Gravette points lack at Ripiceni-Stinca (level III), Udești, Lespezi etc. seem not to agree to the stage of evolution of Romanian Gravettian culture which they have been attributed to. The idea of human communities (believed to belong to evolved stages in Gravettian systematization) returning to techniques and lithic tools (nosed end scrapers carinated, nucleiform ones, rabots, raclettes, etc.) seems fortuitous when we take into account the general characteristics of lithic assemblages. We do not find such an archaic feature in the first levels at Mitoc-Malul Galben which doubtlessly belong to the first stage of Gravettian, both on the stratigraphic basis and on the C-14 datings. If each cultural level in the pluristratified sites has been correctly individualized, both stratigraphically and technical-typologically, we have no other choice than accepting a historical reality which is sometimes hard to understand. Thus, the great number of pieces with rounded edge and of Gravette points at Bofu Mic (level II) (77/53), Dirțu (level V) (144/56), Podiș (level V) (76/60), Buda (91/29) belonging to various geochronological stages is not quite concordant with the percentages in which these two types of pieces are found in other stations considered as contemporary. Even if both blades and bladelets with rounded edge and Gravette points identified in the above mentioned cultural strata belonging to the sites on the Bistrița terraces are cut in best quality silex from the Middle Prut zone, we have to mention that at Ripiceni-Izvor (the site with the largest excavated area) was there were identified such Gravettian items in smaller number.

The presence of points with arched and abruptly retouched side, considered to be of Azilian type and representing Magdalenoid⁶³ elements, as well as that of truncated pieces could lead to analogies with large south, west or central-European areas, but we think that in the present state of research such analogies might have a certain degree of uncertainty.

The contemporaneity of Aurignacian and Gravettian, already stated by M. Cărciumaru⁶⁴, is a historical reality based on both the identity of some types of pieces and palynological and C-14 determinations. Thus, the Dufour bladelets commonly found in the Aurignacian habitations in the Banat⁶⁵, are also found, as we have already seen, in some settlements or habitation levels of the east-Carpathian Gravettian. There are no C-14 datings for the habitations in the Banat, but they belong geochronologically to certain climatic oscillations within which the entire Gravettian from the Carpathians to the Prut River is placed. On the other hand, the C-14 datings reflect the very fact that the first Gravettian levels at Mitoc Malul Galben are earlier than those at Ceahlău-Dirțu (level I) and Bistri-

⁶³ Al. Păunescu, *op. cit.*, 1970, pp. 134–135.

⁶⁴ M. Cărciumaru, *Mediul geografic în pleistocenul superior și culturile paleolitice din România*, București, 1980, pp. 236–247.

⁶⁵ Fl. Mogoșanu, *Paleoliticul din Banat*, București, 1978, *passim*; idem, *Prezența lamelelor Dufour în așezările acropaleolitice din Banat*, in *SCIV*, 18, 1967, 1, pp. 141–146.

cioara-Lutărie (level I). as the latter are contemporary with levels III—IV—at Mitoc-Malul Galben dated to 25,000—23,000 B.P.

Over 50 Gravettian settlements in Romania have been systematically excavated and researched so far and the number of those identified through surface surveys is three times bigger⁶⁶. There have been found sites with cultural strata from Mousterian and Gravettian, from Aurignacian and Gravettian and even Gravettian multistratified stations, although there are also sites with only one habitation level. In the latter case we shall notice a great development of settlements in the evolved stages of culture and in Epigravettian, to which all the habitations and cultural levels believed as belonging to the Final Gravettian will have to be reported, because they are geochronologically placed in the Tardiglacial. Most of the habitations are situated on river terraces or on high plateaux (whose specific feature is the existence of 2—7 habitations quite close to one another), cave settlements being very scarce.

A characteristic of the habitations situated near geological deposits, rich in raw material of best quality, are the lithic workshops, the special shelters and the hearths which reflect a great intensity of habitation.

The circulation of raw material of superior quality was quite intensive, too. We are referring to the presence of Prut silex in the entire east-Carpathian space up to Țara Oașului, and also to the presence of pieces made of obsidian in certain habitations in Moldavia. This element also demonstrates the great mobility of the human groups either hunting or looking for new deposits rich in raw material of better quality or, in general, for new ecological environments fit for living. This is the reason of the non-uniformity of lithic inventories, explained by the human groups bringing or adopting new technical-typological categories, by an intense circulation of elements from diverse cultural areas. Thus the polyphyletic origin of some technocomplexes is not doubtful any longer and we can also explain, the presence of shouldered pieces (whose origin is east or central European) or of leaf-shaped points with retouch on the ventral face in the habitations on the Prut, in the south of the Moldavian Plateau or at Climente I-Dubova, with analogies in the east or in the centre of the continent. It also makes us, not look for the origins of the Gravettian in the entire Plateau of Moldavia (the sub-Carpathian zones of the Bistrița terraces included) only in the east of Europe or to report the habitations in Țara Oașului to the Săgvarian group.

⁶⁶ Cf. Al. Păunescu, P. Șadurschi, V. Chirica, *Repertoriul arheologic al județului Botoșani*, vol. I, București, 1976, *passim*; Ghenuță Coman, *Statornicie, continuitate. Repertoriul arheologic al județului Vaslui*, București, 1980, *passim*; V. Chirica, M. Tanasachi, *Repertoriul arheologic al județului Iași*, vol. I—II, Iași, 1984, 1985, *passim*.

Geochronology of Gravettian Technocomplexes

To present a geochronological scheme of the East Carpathians is rather difficult due to the traditional cultural periodization based on research made over three decades ago in the Bistrița Ceahlău region. Subsequently, all Gravettian stations and cultural levels in Romania were related to that. The divisions were correct at that time but they do not correspond to the present realities and databases¹.

In 1980, a new geochronological plan was suggested for the Romanian Upper Pleistocene. It was based on results of pollen studies done mostly on soil samples from Carpathian caves². Thus, several indigenous climatic oscillations identified were correlated with those known in West and Central Europe.

A renewed attempt at dating the principal sites was made in 1984³. It was based on limited C-14 tests. The author adapted the European Alpine glacial chronology as a basis of his summations. By 1989, the ever greater number of C-14 dates permitted a much more accurate dating of Würmian stades, interstades and their climatic oscillations⁴.

A second series of difficulties were encountered while attempting to elaborate the geochronology of local Moldavian Gravettian. They consisted in the mechanical interpretation of the results obtained from dating laboratories, without taking into consideration important elements such as :

¹ Fl. Mogoșanu, *Despre stratigrafia și periodizarea Gravettianului din Moldova*, in *SCIVA*, 37, 1986, 2, pp. 159—162.

² M. Cărciumaru, *Mediul geografic în Pleistocenul superior și culturile paleolitice din România*, București, 1980.

³ Al. Păunescu, *Cronologia paleoliticului și mezoliticului din România în contextul paleoliticului central-est și sud european*, in *SCIVA*, 35, 1984, 3, pp. 235—265.

⁴ M. Otte, *Le Gravettien en Europe Centrale*, Brugge, 1981, vol. I, pp. 30—31 ; O. Soffer, *The Upper Paleolithic of the Central Russian Plain*, Academic Press, 1985 ; P. Allsworth-Jones, *The Szeletian and the Transition from Middle to Upper Paleolithic in Central Europe*, Oxford, 1986.

a) with several sites, the chemical pretreatment of charcoal wood samples by laboratory technicians led to a „terminus ante quem“ age⁵;

b) the ignoring of age results offered by samples of non-burnt bones, burnt ones and charcoal, respectively although, the latter provides the most correct results;

c) the lack of correlations (which are sometimes impossible) between C-14 datings and seemingly real geological and archeological levels;

d) the overestimation of C-11 results, without correlating them with other datings in the classical archeological literature.

In trying to surpass these impediments, it is necessary to detail the geological characteristics of Malul Galben-Mitoc, which has given so far the richest series of Upper Paleolithic radiocarbon datings (34). Late Fl. Mogoşanu's observations, of 1985 are still pertinent and will be added to our own.

The sites of Mitoc-Malul Galben is situated in colluvial sediments in a short canyon sheltered by the flanks of the southeast ward flowing Prut river to the east and by the Ghireni creek to the south. The colluvium is both aeolian and aquatic in origin, the layers of aquatic origin having been laid down on this "empty place" in a completely non-uniform succession characterized by a bidirectional inclination of strata. F. Bordes explained in a study⁶ certain modalities of non-uniform sedimentation which, presenting the same horizontal co-ordinates at first sight, may contain totally different geological and archeological levels.

The way in which loessoid formations are sedimented at Mitoc-Malul Galben is even more non-uniform, and different from the phenomena existing on a terrace. The granulometric analyses, which are under way will enable us to convincingly explain the concrete situation in this geomorphologic formation. A second possibility would be that combined granulometric, chemical and palynological analyses be carried out in several spots (3—5) in each direction of inclination of geological strata (N—W—S). They should entail both geological and archeological stratigraphic coherence. Excavations will be completed only when they reach the bedrock (at about — 13.50 m). By then, a large enough open surface for bidirectional correlations will have been revealed.

The present 34 results of C-14 tests have to be used as such even though they now seem to be in relative contradiction with the bidirectional archeological and geological stratigraphy. Only this way could we explain seeming anomalies, such as the ages of 23,070 \pm 180 B.P. — GrN 13006 (A₃ — 8.15 m), 26,910 \pm 450 B.P. — GrN 14037 (II₇ — 8.75 m) and 27,410 \pm 430 — GrN 14914 (B₁ — 8.70 m). The first dating was performed on bones and the other two on charcoal.

⁵ According to information received from K. Honea, this fact is the cause of differences of values communicated by him and by Al. Păunescu for certain samples from Bistricioara-Lutârie. Cf. Al. Păunescu, *op. cit.*, p. 240; K. Honea, *Chronometry of the Roumanian Middle and Upper Palaeolithic. Implications of Current Radiocarbon Dating Results*, in *Dacia*, N.S., XXVII, 1984, 1—2, pp. 23—39. A letter sent by dr. W. G. Mook, Director of the Isotopic Laboratory in Groningen, dated January 12, 1988, dates suggested by Al. Păunescu are correct although the two samples were not chemically pretreated.

⁶ F. Bordes, *Sur la notion de sol d'habitat en préhistoire paléolithique*, in *BSPF*, 72, 1975, 5, pp. 139—144.

Turning to the problem of the geochronology of East Carpathian Gravettian (or, as a matter of fact, Romanian Gravettian), we could state that the first phases of this technocomplex have been identified at Malul Galben-Mitoc. Even if the dating of $28,910 \pm 480$ (GrN — 12636) (in D₄ square, — 7.85 m) didn't belong to the first Gravettian level but to the last Aurignacian habitation, the other datings of the first Gravettian level converge and seem congruent with the generally accepted image of the beginnings of Central European Gravettian. It can be temporally placed in the Ohaba B climatic oscillation (according to M. Cărciumaru) and correlated with: Stillfried B — Denekamp 2 — Salpêtrière (France) — Maisières (Belgium) — Briansk (USSR)⁷. The Malul Galben dating follow:

Laboratory Number	Results	Range	Square, Depth
1. GrN-12636	$28,910 \pm 480$	29,390—28,430	D4-7.85 m
2. OxA-1778	$27,500 \pm 600$	28,100—26,900	A2-8.15 m
3. GrN-14914	$27,410 \pm 430$	27,840—26,980	B4-8.70 m
4. GrN-12635	$27,150 \pm 750$	27,900—26,400	G1-6.35 m
5. GrN-15453	$27,100 \pm 1,500$	28,600—25,600	C5-8.70 m
6. GX-8723	$\geq 27,500$		B6-5.00 m

Results number 3, 5, 6 may be considered as doubtful because 3 and 5 seem to come from a soliflucted zone, and 6 is considered by K. K Honea as being of an age of $>33,000$ and thus unworth taking into account. This suggestion is in contradiction with the co-ordinates of the archeological and cultural level.

This level might even have two chronological horizons which have not been stratigraphically delimited yet.

Level II is dated between $26,910 \pm 450$ (GrN-14037) or $26,750 \pm 600$ (GrN-14035) and $25,140 \pm 210$ (GrN-14036). Four of the results (1, 4, 6, 9) could be considered as doubtful because they are situated outside the stratigraphic co-ordinates, coming from soliflucted zones.

The ages of level II are:

Laboratory Number	Results	Range	Square, Depth
1. GrN-14037	$26,900 \pm 450$	27,630—26,460	H7-8.75 m
2. GrN-14035	$26,750 \pm 600$	27,350—26,150	G5-6.80 m
3. GX-9418	$26,700 \pm 1,040$	27,740—25,660	B5-7.10 m
4. GrN-15451	$26,530 \pm 400$	26,930—26,130	I13-9.45 m
5. GrN-15449	$26,100 \pm 800$	26,900—25,300	J5-6.80 m
6. GrN-15456	$25,930 \pm 450$	26,380—25,480	A7-10.10 m
7. GrN-15808	$25,840 \pm 90$	25,930—25,750	J7-7.00 m
8. GrN-15450	$25,610 \pm 220$	25,830—25,390	G4-7.00 m
9. GrN-14913	$25,330 \pm 420$	25,750—24,910	C4-8.15 m
10. GrN-14036	$25,140 \pm 210$	25,350—24,930	G4-7.00 m

⁷ These correlations were established on the basis of the papers of M. Cărciumaru (*op. cit.*, 1980), M. Otte (*op. cit.*, 1981), Al. Păunescu (*op. cit.*, 1984), P. Allsworth-Jones (*op. cit.*, 1986) and O. Soffer (*op. cit.*).

Level II might be synchronous with the last part of Kesselt-Stillfried B-Briansk climatic oscillation in Al. Păunescu's periodization.

Level III is dated between $24,820 \pm 850$ B.P. (GX-9425) and $23,490 \pm 280$ B.P. (GrN-14034) :

Laboratory Number	Results	R a n g e	Square, Depth
1. GX-9425	$24,820 \pm 850$	25,670–23,970	G7-5.60 m
2. OxA-1780	$24,650 \pm 450$	25,100–24,200	J8-5.40 m
3. GX-9422	$24,620 \pm 810$	25,430–23,810	B7-5.00 m
4. GrN-15457	$24,400 \pm \begin{smallmatrix} 2200 \\ 1700 \end{smallmatrix}$	26,600–22,700	D5-10.65 m
5. GrN-14034	$23,850 \pm 330$	24,160–23,500	J5-5.75 m
6. OxA-1779	$23,650 \pm 400$	24,050–23,250	G8-5.05 m
7. GrN-15805	$23,490 \pm 280$	23,770–23,210	J3–4-6.15 m
8. GX-8725	$\geq 23,100$		F5-6.40 m
9. GrN-13006	$23,070 \pm 180$	23,250–22,890	A3-8.15 m
10. GrN-15448	$\geq 23,000$		J6-5.75 m
11. GX-9420	$22,050 \pm 1\ 250$	23,300–20,800	C6-6.60 m

Results 4, 8, 9, 10, 11 may be considered as doubtful owing to the standard error, to their being situated under the stratigraphic co-ordinates or to the uncertainty of datings.

This level is synchronous with Herculane I climatic oscillation in Marin Cârciumaru's scheme, paralleled with Tursac climatic oscillation. The habitation could be contemporary with level II at Bistricioara-Lutărie, dated to $23,450 \pm \begin{smallmatrix} 2000 \\ 1450 \end{smallmatrix}$ B.P. (GX–8727–G).

Level IV may be placed between $19,910 \pm 990$ B.P. (GX–8724) and $20,945 \pm 850$ (GX–9424), that is during Herculane II (= Laugerie) climatic oscillation, and if we take into consideration the dating of $17,300 \pm \begin{smallmatrix} 2100 \\ 1670 \end{smallmatrix}$ B.P. (GX–9423) we could admit its prolongation into Românești = Lascaux climatic oscillation.

Laboratory Number	Results	R a n g e	Square, Depth
1. GX-9424	$> 21,000$		G7-5.60 m
2. GX-8503	$20,945 \pm 850$	21,795–20,095	C2-7.00 m
3. GrN-14031	$20,300 \pm 700$	21,000–19,600	J6-3.60 m
4. GrN-13765	$20,150 \pm 210$	20,360–19,940	J7-3.10 m
5. GX-8724	$19,910 \pm 990$	20,900–18,920	D3-6.10 m
6. GX-9429	$19,900 \pm 1050 - 950$	20,950–18,950	C6-6.60 m
7. GX-9423	$17,300 \pm 2100 - 1670$	19,400–15,630	A4-6.80 m

Although they seem to be situated outside the stratigraphic co-ordinates, datings 2, 3, 4, 5 express the correct age of level IV, and datings 6 and 7 contain quite great standard errors.

In general, this level may be correlated with the interval between Tursac and Laugerie climatic oscillation (according to M. Otte); it could be synchro-

nous with the upper part of level II and the upper horizon of level III at Bistricioara – Lutărie, dated to $20,300 \pm 1300$ B.P. (GX – 8726) and $20,995 \pm 875$ B.P. (GX – 8729).

Finally, a presumptive habitation level situated over the sand lens might belong to Tardiglacial.

According to M. Cârciușmaru and Al. Păunescu, these ages can be placed during the climatic oscillation of Herculane II – Laugerie. According to M. Otte, they may be placed during the interval separating the cold climatic episodes Tursac from Laugerie (Western Europe), P. VI and Würm III-b (France), the interval between the Upper Würm and Würm III (Czechoslovakia). This level can be compared with that at Bistricioara-Lutărie (the upper part of level II and the lower horizon of level III): $20,300 \pm 1,300$ (GX – 8726) and $20,995 \pm 875$ (GX – 8729), respectively.

The traditional chronological limit of the Romanian Gravettian Techno-complex has to be lowered from the Herculane I (= Tursac) climatic oscillation to the limit of the climatic episode of Ohaba B – Kesselt – Denekamp 2 – Stillfried B. We have no certain clues as for an earlier dating of the Gravettian in Țara Oașului other than that for Mitoc-Malul Galben.

According to estimations suggested by Al. Păunescu, the Romanian Gravettian lasts (under the forms of Epi- and Tardigravettian) up to Early Tardiglacial. It was then that there appeared the Epipaleolithic elements of Mediterranean type which were identified at Cuina Turcului – Dubova and dated to $12,050 \pm 120$ B.P. (Bln – 802), $12,600 \pm 120$ B.P. (Bln – 803) and $10,125 \pm 200$ B.P. (Bln – 802). They can be compared with Bölling – Dryas II climatic episodes in almost all of European space.

The most important aspect of research is the inclusion of the habitations and habitation levels, first of all those in the East Carpathian space, in the new geochronological frame.

We are convinced that in the coming years, by extending the researches at Mitoc-Malul Galben, when we are able to use complete series of datings with radiocarbon corroborated with chemical, palynological and granulometric analyses and with certain pedological studies under way, this site will offer the best background for the whole Gravettian Techno-complex culture, delimiting each cultural – chronological stage. At present, it is of the highest importance to systematize the Gravettian on the Bistrița terraces, lithic inventories included, in correlation with the new opinions concerning the geological and archeological stratigraphy. As Al. Păunescu has already elaborated the new systematization, it is desirable that his valuable scientific observations should be published.

In the present stage of investigations, we think that certain habitation levels in the Ceahlău zone, as well as those at Crasnaleuca (level IV) and Lespezi (levels V – III) cannot be attributed to the „middle“ or „advanced“ stages of Gravettian culture.

If we admit this „division into periodized phases“ of East Carpathian Gravettian we should accept the fact that its first period was contemporaneous with the climatic oscillations of Ohaba B (= Kesselt – Stillfried B – Denekamp 2). It may have been coeval with certain Aurignacian settlements. The second period covered the climatic oscillation Herculane I – Tursac. The third period was synchronic with the climatic oscillation Her-

culane II—Laugerie (which some researchers think as being anterior partially contemporary or immediately posterior to the third Würm stade. The fourth period is Epigravettian and can be correlated to the climatic oscillation Românești (= Lascaux) during Tardiglacial. Finally, late Gravettian (*lato sensu*) is of Tardigravettian nature, with Mediterranean influences and can be related to the first phases of Postglacial (the climatic Bolling and Dryas II episodes).

While working out a new geochronological scheme, of Upper Paleolithic in Romania, and in other European geographic zones, we remarked the desertion of habitations during the last Würmian stade. O. Soffer equates it with the „Valdai Maximum“ (20,000 — 18,000 B.P.). C-14 dates offer results indicating the existence of human habitation levels (though level IV at Crasnaleuca, or Cejkov is dated to $19,460 \pm 220$ B.P., $19,600 \pm 340$ B.P. and $19,755 \pm 240$ B.P., respectively). However, out of the 304 radio-carbon datings presented by P. Allsworth — Jones only 10 indicate ages which can be placed in the cold Würm III (Valdai Maximum), eight of them being in the Mediterranean zone of France and Spain. Other datings, however, are not available.

Another aspect of geochronology is the presence or absence of archeological sterile units which separate Gravettian levels from Aurignacian. There are also one or more habitation levels within Gravettian sites.

As for the first instance, because the filiation of the Gravettian within the Aurignacian has not been argued yet, the absence of sterile between the levels belonging to the two technocomplexes must be attributed to erosional geological phenomena.

In the second case, the situation can be much more complex. There are some site with consistent well delimited sterile strata (Lespezi) but others in which such strata are lacking. The demarcation of certain levels (real, or not) seems to be achieved only by typological criteria. However, there are no sterile strata and these levels are placed within different pedological sediments.

The third category of sites are made up of those in which several cultural levels have been identified within similar pedological sediments by typological criteria. In this case, certain cultural levels should be reevaluated. If no striking qualitative and quantitative differences are noticed, the sites should be attributed to a unique cultural chronological horizon. An exception could be the site at Mitoc-Malul Galben where due to sedimentation erosion in the south part, the real habitation levels situated in the same geological deposits are delimited not only archeologically but by C-14 datings, as well. In this context, it could be more useful to make reference to the real cultural chronological habitation levels in large sites (well defined and detailed) and leave aside the traditional frame which divides the Gravettian into the four or five stages of evolution.

Resuming our discussion on Gravettian geochronology in the East Carpathian region, a possible systematization of its culture levels could be made :

— Ohaba B — Denekamp 2 — Kesselt — Stillfried B : Mitoc-Malul Galben (levels I—II), Mitoc-Piriul lui Istrati (level II), Mitoc-Valea lui Stan ;

— Herculane I — Tursac : Mitoc-Malul Galben (level III), Mitoc-Pîriul lui Istrati (level III), Bistricioara-Lutărie (level II), Stîncă-Ripiceni (level III), Cotu Miculinţi (levels VII—V), Crasnaleuca (levels VIII—V), Cetăţica I (levels II—III) ;

— Herculane II — Laugerie : Mitoc-Malul Galben (level IV), Dolhasca, Crasnaleuca (level IV) Stîncă-Ripiceni (level V), Ripiceni-Izvor (level I — ?), Lespezi (levels VI—III), Poiana Cireşului (levels I—II), Buda, Bistricioara-Lutărie (levels III—IV), Topile (?), Podiş (levels I—II), Cotu Miculinţi (levels I—IV—?) ;

— Româneşti—Lascaux : Mitoc-Malul Galben (level IV), Mitoc-Pîriul lui Istrati (level IV), Ceahlău-Bofu Mic (level II), Poiana Cireşului (level III), Ripiceni-Valea Badelui, Podiş (levels III—IV) ;

— Tardiglacial — the pine phase — Dryas I : Bistricioara-Lutărie (levels V—VI), Ceahlău-Bofu Mare, Ceahlău-Dirţu (level V), Cetăţica I (level IV), Crasnaleuca (levels III—I), Udeşti, Ceahlău-Podiş (level V), Ceahlău-Cremeniş I and II, Stîncă-Ripiceni (level VII) ;

— Tardiglacial — the pine phase — Bölling : Movileni, Măluşteni II—III, Ripiceni-Izvor (level II?), Dorohoi, Moscu, Ţepu ;

— Tardiglacial — the pine phase — Dryas II (Alleröd) : Măluşteni IV—V, Suceveni, Cavadineşti, Bereşti, Puricani, Pleşa.

Some other considerations should be made for the systematization of Middle and Upper Würm at continental level. Thus, after having studied a vast bibliography, Al. Păunescu elaborated the following evolutive frame subsequent to the second Würmian stade, also precisising the ages : Würm II (36,000—32,000) — Arcy (Denekamp) (32,000—30,000) — Kesselt (Stillfried B, Briansk) (29,000—27,000) — Tursac (24,000) — Würm III (23,000—20,000) — Laugerie (20,000—18,000) — Lascaux (18,000—17,000) — Tardiglacial — Dryas I (17,000—13,300)—Bölling (13,300—12,300) — Dryas II (12,300—11,800) — Alleröd (11,800—10,800) — Dryas III (10,800—10,200) — Postglacial⁸. M. Cărciumaru thinks that the second glacial stage was followed by the climatic oscillations of Ohaba A = Arcy, Ohaba B = Stillfried B and Herculane I = Tursac ; there followed the third glacial stage, after which came the Tardiglacial with several climatic oscillations : Herculane II = Laugerie, Româneşti = Lascaux, the Pine Phase : old barren Pinedes : Dryas I, *Pinus Picea* = Bölling, Birch and the new barren Pinedes = Dryas II, Pinedes with much *Picea* = Alleröd and Pinedes with little *Picea* = Dryas IV, after which Holocene began⁹.

M. Otte suggested a new equivalence of climatic episodes : the glacial Würm II stade (33,000—32,000) — Arcy (32,000—30,000) — Kesselt (Salpêtrière, Maisière, Stillfried B, Briansk) (29,000—27,000) — Tursac (24,000) — Würm III stade (23,000—20,000) — Laugerie (20,000—19,000) — Lascaux (18,000—17,000)—Dryas I (16,000—14,000) — Bölling (13,000) — Dryas II (12,000) — Alleröd (11,000) — Dryas III (10,000)¹⁰. In the south-west of

⁸ Al. Păunescu, *op. cit.*, 1984, p. 242.

⁹ M. Cărciumaru, *Les cultures lithiques du Paléolithique supérieur en Roumanie. Chronologie et conditions du milieu*, in *Coll. Int. „La signification culturelle des industries lithiques“*, Liège, 1984, BAR, Int. Series 239, 1985, pp. 235—255.

¹ M. Otte, *op. cit.*, pp. 30—31 ; the ages given by the author in B.C. years have been re-calculated by us in B.P. ones.

France, D. de Sonnevile-Bordes found that, according to French chronology, after the interstade Würm II—III there followed: the beginning of Würm III, Arcy, Tursac, the third glacial stade (ending in this zone at $21,980 \pm 150$ B.P.); there followed the Würm III—IV interstade (= Laugerie), the beginning of Würm IV, Lascaux, Dryas I, Bölling, Dryas II, Dryas II—Alleröd, Alleröd and Dryas III¹¹. J. K. Kozłowski appreciated that the climatic oscillation Arcy was placed around 30,000 B.P., Maisières between 25,700 and 27,700 B.P., Tursac between 22,500 and 24,500 B.P. and Laugerie between 16,500 and 17,700 B.P., placing Eastern Gravettian between 29,900 and 15,000 B.P. and Eastern Epigravettian after 15,000 B.P.¹² O. Soffer considered that the third glacial stade (=Valdai Maximum) took place between 20,000 and 18,000 B.P.¹³, to which date anterior and posterior periods, should be reported to. Finally, based on a quite great number of radiocarbon datings, P. Allsworth-Jones considered that in France and Belgium the climatic oscillation Lascaux was placed between $15,516 \pm 140$ B.P.; Tursac at $23,180 \pm 1,500$ B.P.; Denekamp 1 and 2 = Arcy-Kesselt between $28,200 \pm 700$ and $32,490 \pm 440$ B.P.; in Germany and Denmark, the interstade Denekamp took place between $27,100 \pm 300$ and $28,265 \pm 325$ B.P.; in Austria, Czechoslovakia and Poland, the interstade Stillfried B was placed between $26,230 \pm 240$ and $33,800 \pm 500$ B.P.; in USSR, the interstade Briansk = Dunaevo was placed between $24,200 \pm 1,680$ and $29,650 \pm 1,320$ B.P.¹⁴ The examples could be supplemented with new data which reflect the lack of uniformity in placing the Würmian stades, interstades and associated climatic oscillations at continental level. One can also add that Alpine glacial chronology is not the same in all countries: in Czechoslovakia, the term “pedocomplex” is preferred, and in Hungary that of “fossil soil A, B, C, D”. The new series of radiocarbon datings will also restrict or enlarge the temporal co-ordinates of each climatic oscillation and of each interstade. The lack of concordance of the datings for these geochronological periods is normal as they were neither uniform, nor strictly contemporary in time and space. That is why a geochronological schedule for the Romanian Paleolithic only is absolutely necessary because the use of the general European backgrounds may lead to erroneous determinations of certain cultures and habitation levels. The geochronologic schedule suggested by M. Cărciu-maru is correct, in general, on the basis of the new C-14 determinations, but it should be improved and correlated with the new historic realities specific not only to Romania but to various other geographic areas, as well, each of them with its own ecological features. In our opinion, it is necessary that the local climatic features in the East Carpathian space (the richest zone in Gravettian settlements), specific to the Moldavian Plateau and even to the Prut—Dniester zone, be identified. We could thus acquire a more complete image and further knowledge of the characteristics of the natural environment in which the Gravettian human communities have

¹¹ D. de Sonnevile-Bordes, *Culture et milieu d'Homo sapiens en Europe*, in *Coll. Int. du C.N.R.S.* nr. 599 — *Les processus de l'hominisation*, Bordeaux, p. 117.

¹² J. K. Kozłowski, *The Gravettian in Central and Eastern Europe*, in *Advances in World Archaeology*, V, 1986, pp. 133, 135.

¹³ O. Soffer, *op. cit.*, pp. 173—176.

¹⁴ P. Allsworth-Jones, *op. cit.*, table 1, pp. 1—6.

evolved and a more precise placing on general continental level, which would facilitate the task of establishing the position of the Moldavian Gravettian in comparison with Europe's greater cultural areas. The great mobility of the Gravettian human groups in the East-Central zones of Europe is proven by the trading of raw material and the variability of certain types of worked pieces, by the lack of homogeneity of lithic inventories which should not represent real levels or distinct cultural-chronological habitation stages.

When taking into account the similarity of some types of tools we find, for instance, that the bifacial leaf-shaped points at Ripiceni-Izvor are quite similar to those at Corpaci on the Prut (stratum IV, dated to $25,250 \pm 300$ B.P./GrN-9758)¹⁵; while the level at Ripiceni is placed by Al. Păunescu in the Late Epigravettian (Bölling—Alleröd)¹⁶, we have attributed it to the generally accepted age for the climatic oscillations of Herculane II — Laugerie. These pieces, being associated with those of a segmentiform aspect, could seem nearer to the final stage of Gravettian culture. At Brinzeni I, stratum III, there is a similar situation to that at Crasnaleuca and Cotu Miculinți, with pieces of archaic character: sidescrapers, denticulate pieces and retouched flakes, and the fauna is dominated by the big herbivorous animals among which we also find the horse, the reindeer and the bison¹⁷. But we consider that to make references only to taxonomic units without a strict corroboration with radiocarbon datings can lead to far-fetched similarities in the sense of admitting certain strata of Gravettian and Epigravettian culture¹⁸ into a taxonomic unit, sometimes with a rather great distance of evolution in time, given that not only have these two great chrono-cultural stages their own features but within each period there are outstanding differences. All these elements are determined by a certain specialization based on the nature of the raw material to which the possible influences of the groups belonging to other cultural areas, they got in touch with (owing to the great mobility of the communities of hunters), are added. The ecologic environment specific to each geographic zone (vegetal background species of animals existent in the respective habitat, climate conditions, etc.) has contributed on a large scale to the quite strict characterization of a level of Gravettian culture. So, the possible taxonomic units can be in disagreement to other cultural and geo-chronological elements. Thus, for instance, the prevalence of bovines and of certain pieces of Mousterian tradition (rabots, sidescraper) is normal at Crasnaleuca and Cotu Miculinți, due to the Gravettian communities' specialization in processing antlers and reindeer horns and bones, to which the quality of the raw material is added. Such a characteristic would have been almost impossible in a zone where people had to process only quartzite, gritstone etc.

Coming back to the dates of Gravettian's absolute chronology we can find certain identities, even though there are differences as regards the cultural and technical-typological characteristics of the culture strata. Thus, the first two habitation levels at Mitoc-Malul Galben, dated between $27,150 \pm$

¹⁵ I. A. Borziak, G. V. Grigorieva, N.A. Ketraru, *Poselenija drevnekamennogo veka ny severo-zapade Moldavii*, Chișinău, 1982.

¹⁶ Al. Păunescu, *op. cit.*, 1984, p. 242.

¹⁷ N.A. Ketraru, *Pamjatniki epoch paleolita i mezolita*, Chișinău, 1974, p. 72.

¹⁸ J. K. Kozłowski, *op. cit.*, *passim*.

750 B.P. (GrN-12636) and $26,750 \pm 600$ B.P. (GrN-14035), can be synchronized with that part of the Denekamp interstade and with the lower one of the Post-Denekamp oscillation in Germany and Denmark, dated between $27,750 \pm 250$ B.P. (GrN-4999) and $26,440 \pm 800$ B.P. (Bln-221), with the Würm II—III interstade (= Pod Ilradem sequence) in Czechoslovakia, dated to $26,830 \pm 300$ B.P. (GrN-1918), or with Stillfried B interstade, dated to $26,230 \pm 240$ B.P. (GrN-4995), with the Fossil Soil C in Hungary, dated between $27,855 \pm 1,589$ B.P. (Hv-5422) and $26,350 \pm 3,110$ B.P. (Hv-1777), even if the uncertainty of \pm is so great, and with Briansk fossil soil (= Dunaevo interstade) in USSR, dated to $27,500 \pm 1,500$ B.P. (Lu-28 A), with levels 6—8 at Willendorf II, dated toward 26,000 B.P., with the lower stratum at Kostenki 8, whose dating is $27,700 \pm 750$ B.P. (GrN-10509) or with stratum 9 at Asprochali (Greece), dated to $26,100 \pm 900$ B.P. (I — 1956). The upper part of levels II and III in the same site, dated to $24,820 \pm 850$ B.P. (GX-9425) and $25,140 \pm 210$ B.P. (GrN-14036) can be assimilated with the Post-Denekamp oscillation in Germany and Denmark, dated to $25,240 \pm 1,000$ B.P. (Bln-360), with the upper part of Briansk fossil soil (= Dunaevo interstade) in USSR, dated to $24,430 \pm 400$ B.P. (GrN-5446) at Sungir and $25,600 \pm 360$ B.P. (Lu-28 B) at Dunaevo. Level III at Mitoc-Malul Galben and the lower part of level II at Bistricioara-Lutărie, placed between $24,620 \pm 810$ B.P. (GX-9422), $23,830 \pm 330$ B.P. (GrN-14034) and $23,450^{+2,000}_{-1,450}$ B.P. (GX-8728-G) may have correspondences in Tursac oscillation in France and Belgium ($23,180 \pm 1,500$ B.P. — Gay-69) or at Molodova V, stratum 7, dated to $23,000 \pm 800$ B.P. (Mo-11) and $23,700 \pm 320$ B.P. (GIM-10). Level IV at Mitoc-Malul Galben, through the age of $20,300 \pm 700$ B.P. (GrN-14031), presents the smallest range of uncertainty of all the tests performed so far. It is synchronic with levels II—IV at Bistricioara-Lutărie, dated to $20,300 \pm 1,300$ B.P. (GX-8725) and $20,995 \pm 875$ B.P. (GX-8729), with Valdai Maximum (according to O. Soffer), with the Fossil Soil B in Hungary, whose age is of $20,520 \pm 290$ B.P. (Hv-2591) and $20,350 \pm 470$ B.P. (Hv-1775), and with the Protomagdalenian at Abri Patand, stratum 2 ($20,340 \pm 200$ -GrN-2115). Finally, the last absolute age of some Gravettian habitation levels in Romania refer to Bistricioara-Lutărie, level IV, dated to $19,055 \pm 925$ B.P. (GX-8730), Crasnaleuca, level IV, dated to $19,460 \pm 220$ B.P. (Bln-1443) and Lespezi, levels V—III, dated to $18,020 \pm 350$ B.P. (Bln-808) and $18,110 \pm 300$ B.P. (Bln-806), which could correspond to the formation of fossil soil at Chabry, whose age was established to be of $18,050 \pm 300$ B.P. (BONN-850) and $18,270 \pm 530$ B.P. (BONN-852)¹⁹, or to the habitation at Cejkov, dated to $19,600 \pm 340$ B.P. and $19,755 \pm 240$ B.P.²⁰

Therefore, the Gravettian at Mitoc-Malul Galben corresponds almost entirely to that in Italy, dated between $27,400 \pm 1,720$ B.P. (F-24) and $18,750 \pm 350$ B.P. (R-297), as well as to that in the centre and the East of Europe—Austria, Germany, Czechoslovakia and Poland — but the first Gravettian echoes at Willendorf II/5, Mauern C₂, D, Dolní Věstonice II and Nemšova are dated between $32,000 \pm 300$ and $28,625 \pm 325$ B.P., its final part corresponding exactly to level IV at Mitoc-Malul Galben.

¹⁹ All the datings have been taken from P. Allsworth-Jones, *op. cit.*, table 1.

²⁰ Cf. J.K. Kozłowski, *op. cit.*, p. 165, without the number of the sample or the indicative of the laboratory.

The Gravettian in Hungary may be a little earlier than the first level at Mitoc-Malul Galben, but the dating of $28,700 \pm 3,000$ B.P. (GXO-195) from Bodrogheresztur contains a very great range of uncertainty and cannot be taken into consideration. The other datings prove that the habitation levels at Balla, Ságvár and Arka are posterior to those in Romania. Although some habitation levels at Arka, Madaras and Ságvár seem to be contemporary with those at Lespezi, a unity of Molodova, Buda, Lespezi and Arka would be, in our opinion, hard to support²¹.

The Gravettian on the Dniester valley, at Molodova V, contains quite a rich sequence of chronological ages of levels 9—4, dated between $29,650 \pm 1,320$ B.P. (LG-15h) and $17,100 \pm 1,400$ B.P. (GIN-147). The second dating of stratum 9— $28,100 \pm 1,000$ B.P. (LG-15a) — presents the same range of uncertainty, so that this stratum could be contemporary with the first habitation level at Mitoc-Malul Galben and not anterior to it. Moreover, the lack of intermediate datings seems to represent true gaps as regards the habitation, which is not true of the Middle Prut area. The last ages of the Epigravettian at Molodova (levels 6—4) aged $16,750 \pm 200$ (GIN-105), $17,100 \pm 180$ (GIN-52) and $17,000 \pm 1,400$ (GIN-147) B.P. can be contemporary with level III at Lespezi ($17,620 \pm 320$ B.P. can be contemporaneous with level III at Lespezi ($17,620 \pm 320$ B.P. — Bln-805) or with the lower part of level IV at Bistricioara-Lutărie, dated to $16,150 \pm 350$ B.P. (GrN-10528). These ages can be synchronized with the Lascaux interstade, dated by A. Leroi-Gourhan between 18,000 and 16,000 B.P.²².

Therefore, in the evolution of European Gravettian and in that of the Romanian one five geochronologic stages may be distinguished²³:

1. The first stage, absent in Romania, is dated between about 32,000 and 28,000 B.P., and contains the settlements at Willendorf II, stratum V, Dolní Věstonice II, the fossil soil, Mauern, strata C₂ and D, Molodova V, strata 9—8, Kostenki XIV (Markina Gora), stratum 2, etc. As J.K. Kozłowski remarked, these aggregates are quite homogeneous and many of the habitations have datings with a high degree of uncertainty, but present certain common features, too, enabling us to deduce the polyphyletic origin of the Gravettian culture.

2. The second period, early in Romania and middle in Central Eastern Europe, contains a very numerous group of habitations generally dated between 28,000/27,000 and 24,000 B.P. It seems that the most complete series of datings was obtained so far at Mitoc-Malul Galben. It is difficult to precise if we must look for the origins of the Gravettian in the Prut valley in the valleys of the Dniester, Don or Desna rivers, or in Central Europe (Austria, Moravia). Kostenki 8, the lower stratum, for instance, dated to $27,700 \pm 750$ B.P. (GrN-10509), belongs to the same series of four ages as Mitoc-Malul Galben, the first of them ($27,150 \pm 750$ B.P.-GrN-12635) being very near not only

²¹ *Ibidem*, p. 194.

²² A. Leroi-Gourhan, *Interstades würmiens Laugrie et Lascaux*, in *Bulletin de l'Association Française pour l'Etude du Quaternaire*, 1, 1930, pp. 95—103.

²³ Cf. Al. Pănescu, *op. cit.*, 1931; *La Préhistoire Française* (under the editorship of H. de Lumley), vol. I-2, Paris, 1976; M. Otte, *op. cit.*, J. K. Kozłowski, *op. cit.*; M. Cărciumaru, *op. cit.*, 1930; L. Bănescu, *Archaeological Research in Slovakia (X-th International Congress of Prehistoric and Protohistoric Sciences, Mexico)*, Nitra, 1931; Vl. Dumitrescu, Al. Bolomey, Fl. Mogoșanu, *Esquisse d'une préhistoire de la Roumanie*, București, 1933, pp. 12—55.

to the habitations in the eastern space, but also to those in the west of the continent: the Perigordian at Abri Pataud, stratum V, the Gravettian in Grotta della Cala, stratum Q I—III and V--VI (although with great degrees of uncertainty in \pm) or from the central zone: Pavlov, Krems-Wachtberg etc.

3. The third period is represented by the middle phase of the Romanian Gravettian and contains the settlements dated between 23,000—20,000/19,000 B.P., that is anterior to the Valdai Maximum. It represents the greatest intensity of habitation in the Upper Pleistocene, with compact groups of lithic inventories, cultural and technical-typological aggregates, but with some local differentiations, which do not affect the homogeneity of the group. The series of datings, more numerous than in the previous stage, prove the intense habitation of the whole continent, before the human communities moved south because of the advancing of the ice cap during the third glacial stage.

4. The fourth period belongs to Tardiglacial and contains a great number of Epigravettian habitations, dated between 18,000 and 15,00 B.P. They constitute a new demographic density over large areas of the continent. As in the previous periods, we discover an intense mobility of the human groups in search for new ecological environments fit for habitation, the use of the old settlements for the new camps being attested by stratigraphic observations.

5. Finally, the last stage, dated between 15,000 and 12,000/10,000 B.P. also contains a great number of habitations belonging to the second period of Epigravettian with certain prolongations from Tardiglacial until Early Holocene. The habitations have a shorter life, being seasonal, and the terraces of the rivers are often left in favour of some higher places like the inter-fluvial plateaux. In almost all the habitations and culture levels of this period there appear the first Epipaleolithic elements of Magdalenian, Tardenoisian, Romellian, etc. aspect. On Romania's territory, this stage ends with the habitations at Cuina Turcului — Dubova, dated to $12,600 \pm 120$ B.P. (Bln-803), $12,050 \pm 120$ B.P. (Bln-804) and $10,125 \pm 200$ B.P. (Bln-802).

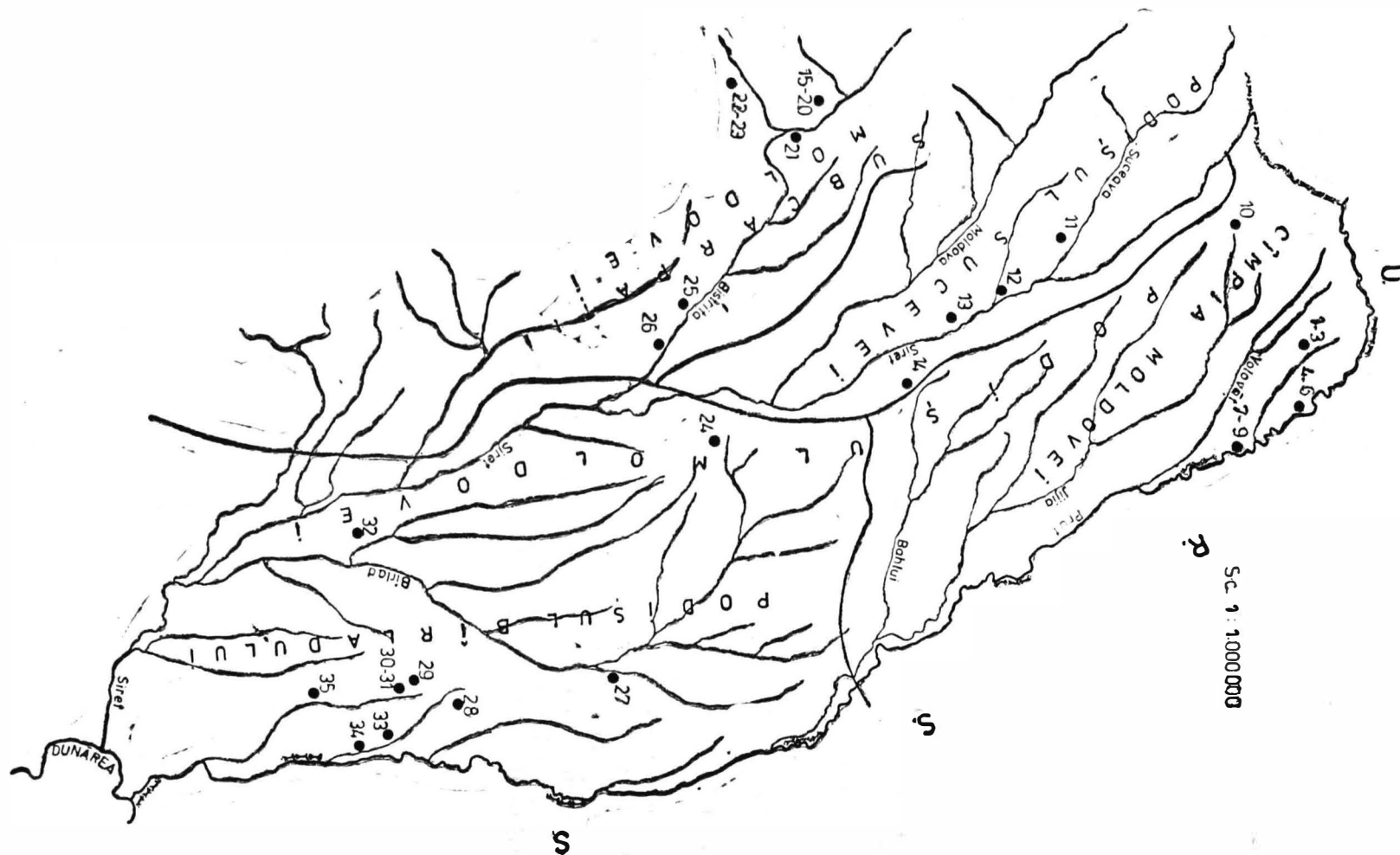


Fig. 1 — The Moldavian Plateau and the sub-Carpathian region. Geographical Subdivisions, Mapping of Gravettian Sites, The numbers on the map correspond to those in the text,

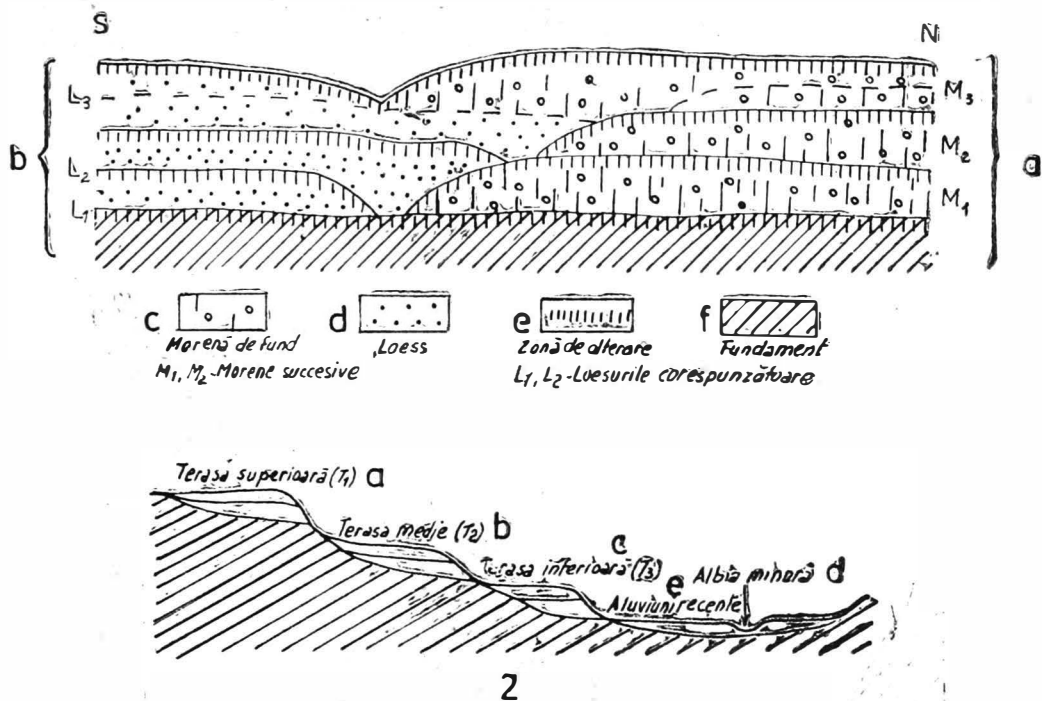
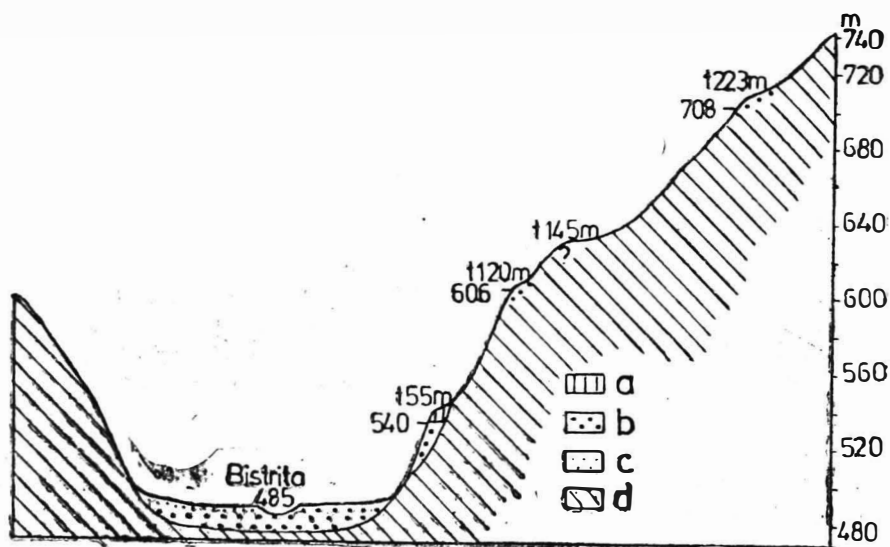
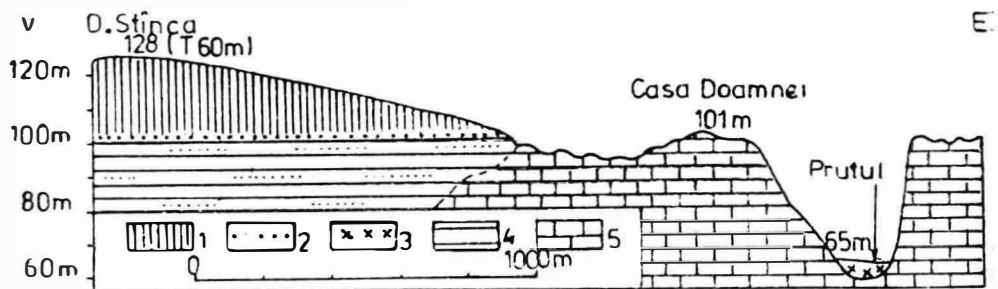


Fig. 4 — 1. Loess and Glaciation Relations : a, moraines ; b, loess ; c, ground moraine ; d, loess ; e, zone of alteration ; f, ground ; 2. Schematic Section of Terrace System : a, upper terrace ; b, middle terrace ; c, lower terrace ; d, river bed ; e, recent alluvial deposits.



2

Fig. 5. — 1. Cross Section of the Prut Valley, North of Stinca-Costesti : 1, quaternary loessoid silts; 2, quaternary sands and gravels; 3, alluvial deposits; 4, clays and marls with sand interpolations; 5, Buglovian limestone (after V. Băcăuanu); 2. Section Through the Bistrița Terraces at Bofu, Downstream the Bistricioara Confluence (after I. Donisă).

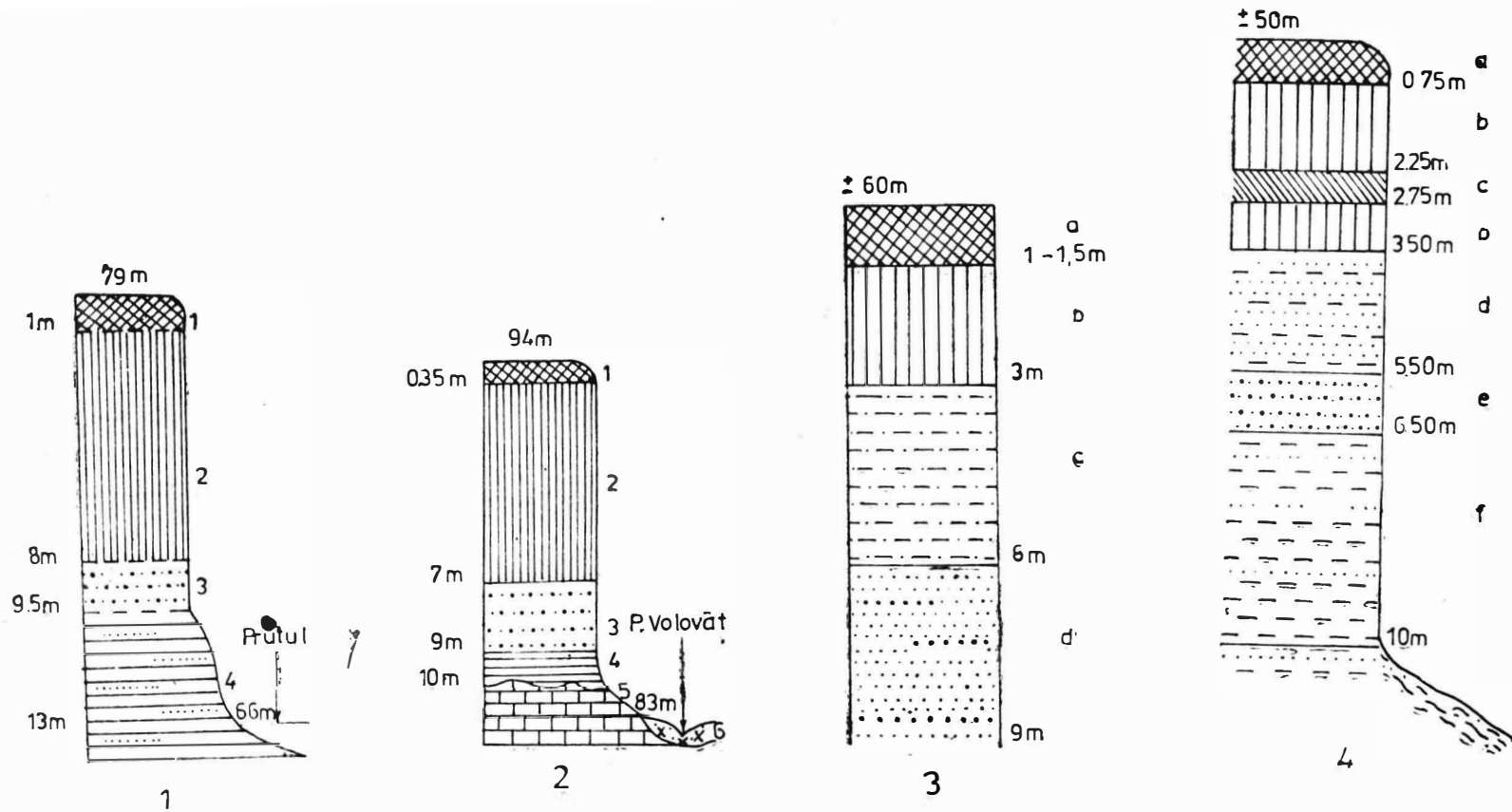


Fig. 6 — 1. Cross Section of the Prut River 10 m High Terrace, South of the Rîșca Village : 1, present-day soil ; 2, sandy silts ; 3, quaternary sands and marls ; 4, Sarmatian marls ; 2. Cross Section of the Prut River 10 m High Terrace Made by the Volovăt Creek, Close to the Ripiceni-Izvor Site : 1, present-day soil ; 2, sandy silts ; 3, quaternary gravels and sands ; 4, Sarmatian clays and marls ; 5, Buglovian limestones ; 6, recent alluvial deposits (after V. Băcăuanu).

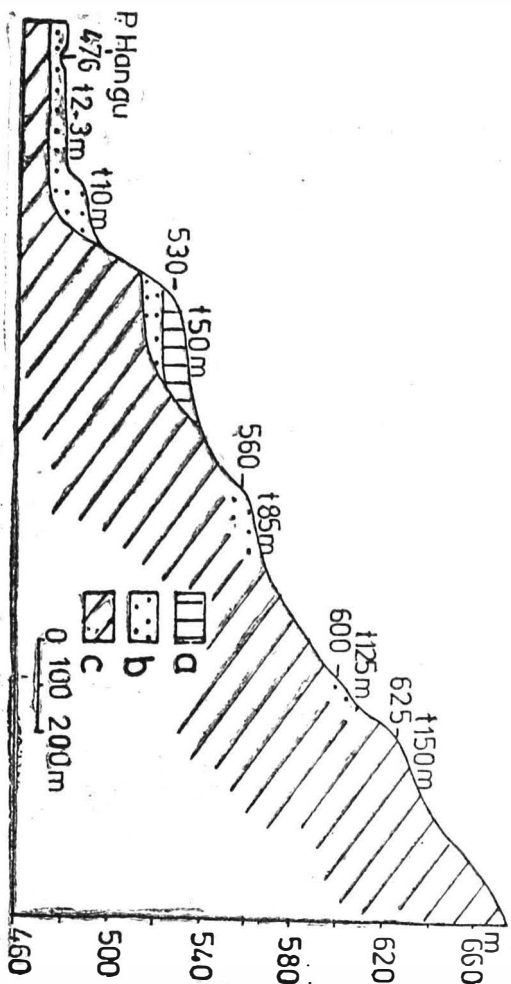
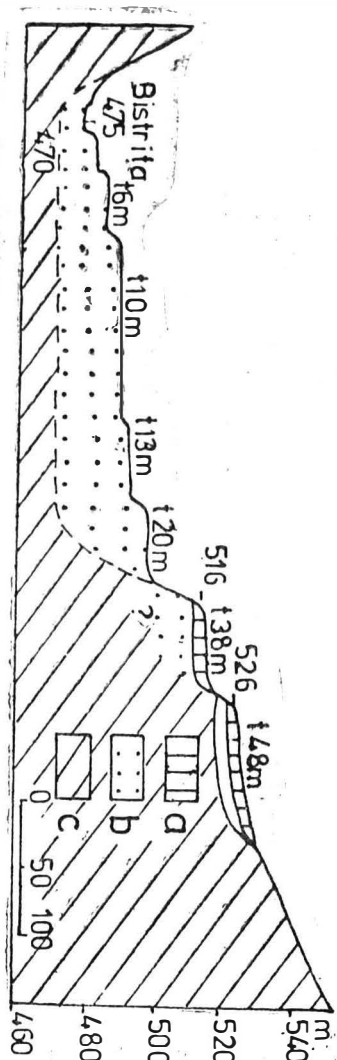
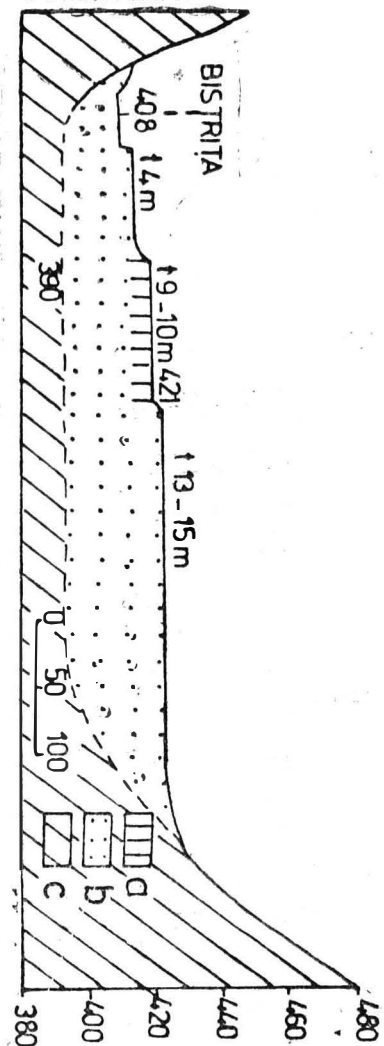


Fig. 7 — 1. Section of the Bistrița Terraces at Bicaz: a, silt; b, gravel; c, gritstones; 2. Section of the Bistrița Terraces Downstream the Tîflic Creek Confluence Within the Perimeter of the Ceahlău Village: a, silt; b, gravel; c, Cretaceous flysch; 3. Cross Section of the Confluence Terrace of the Bistrița River with the Hangu Creek: a, silt; b, gravel; c, Cretaceous flysch (after I. Donișă).

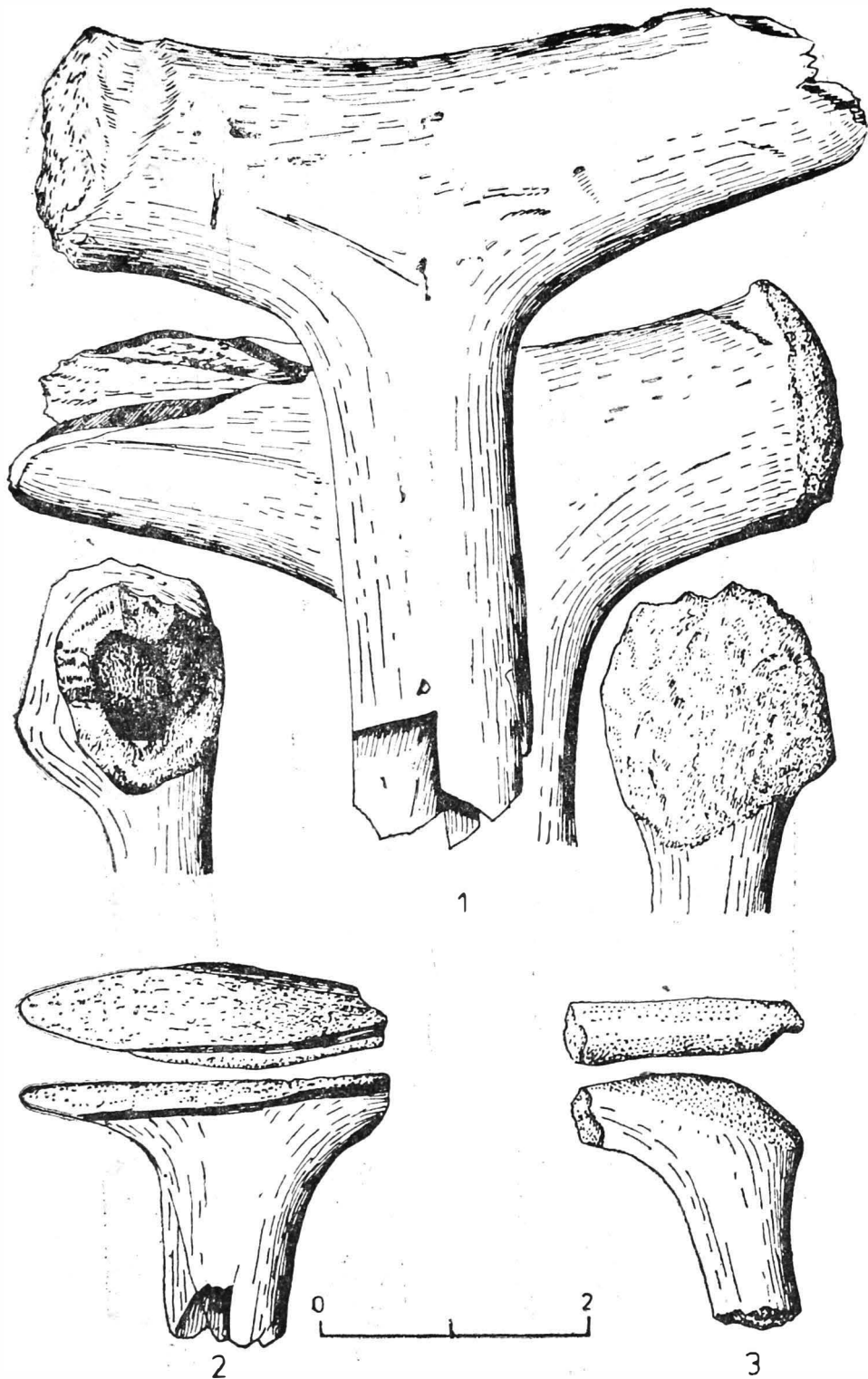


Fig. 8 — Cotu Miculinți. Horn Objects (after M. Brudiu).

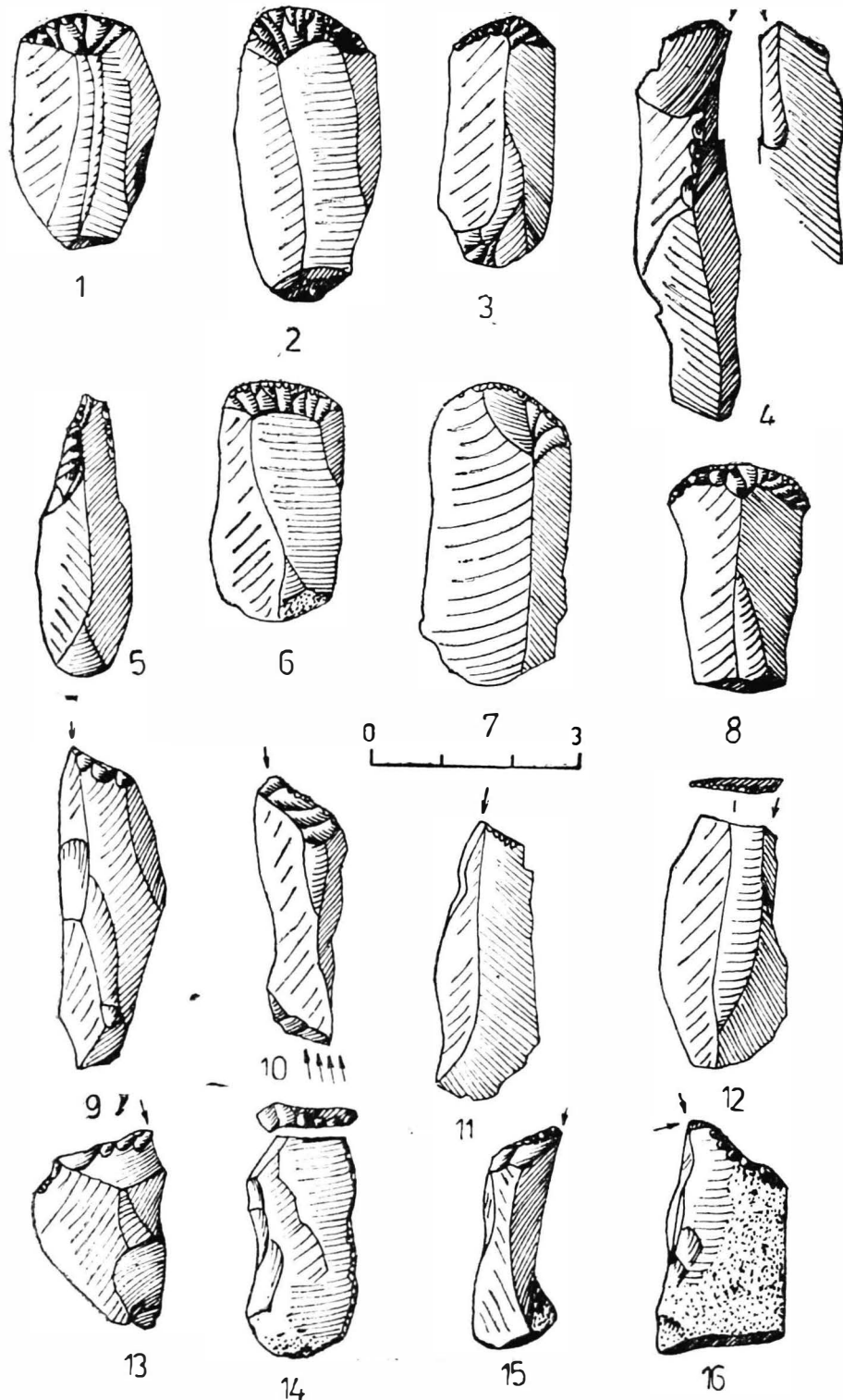


Fig. 9 — Cotu Miculinți : 1—5, level I ; 6—16, level II (after M. Brudiu).

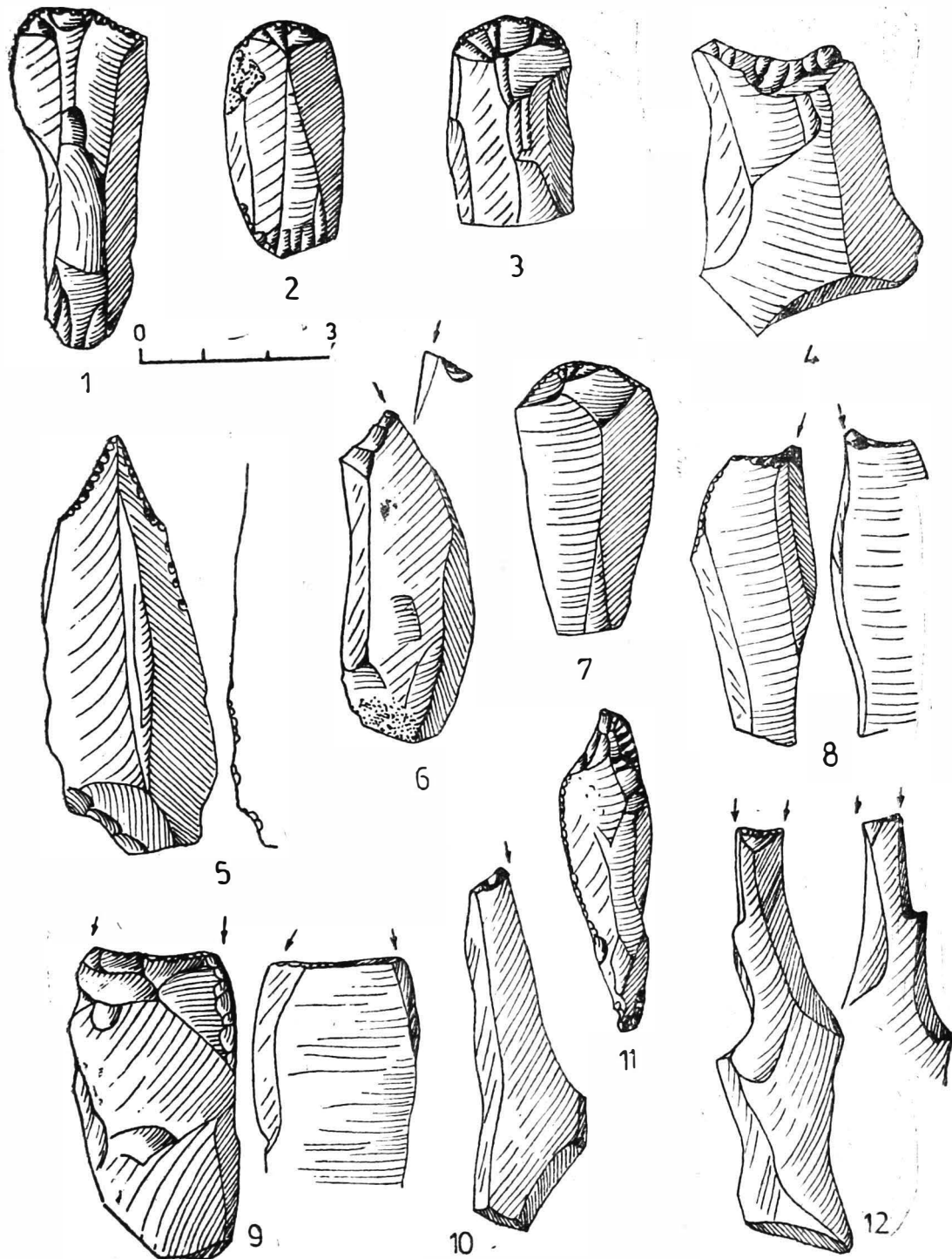


Fig. 10 — Cotu Miculinți : 1-12, level III (after M. Brudiu).

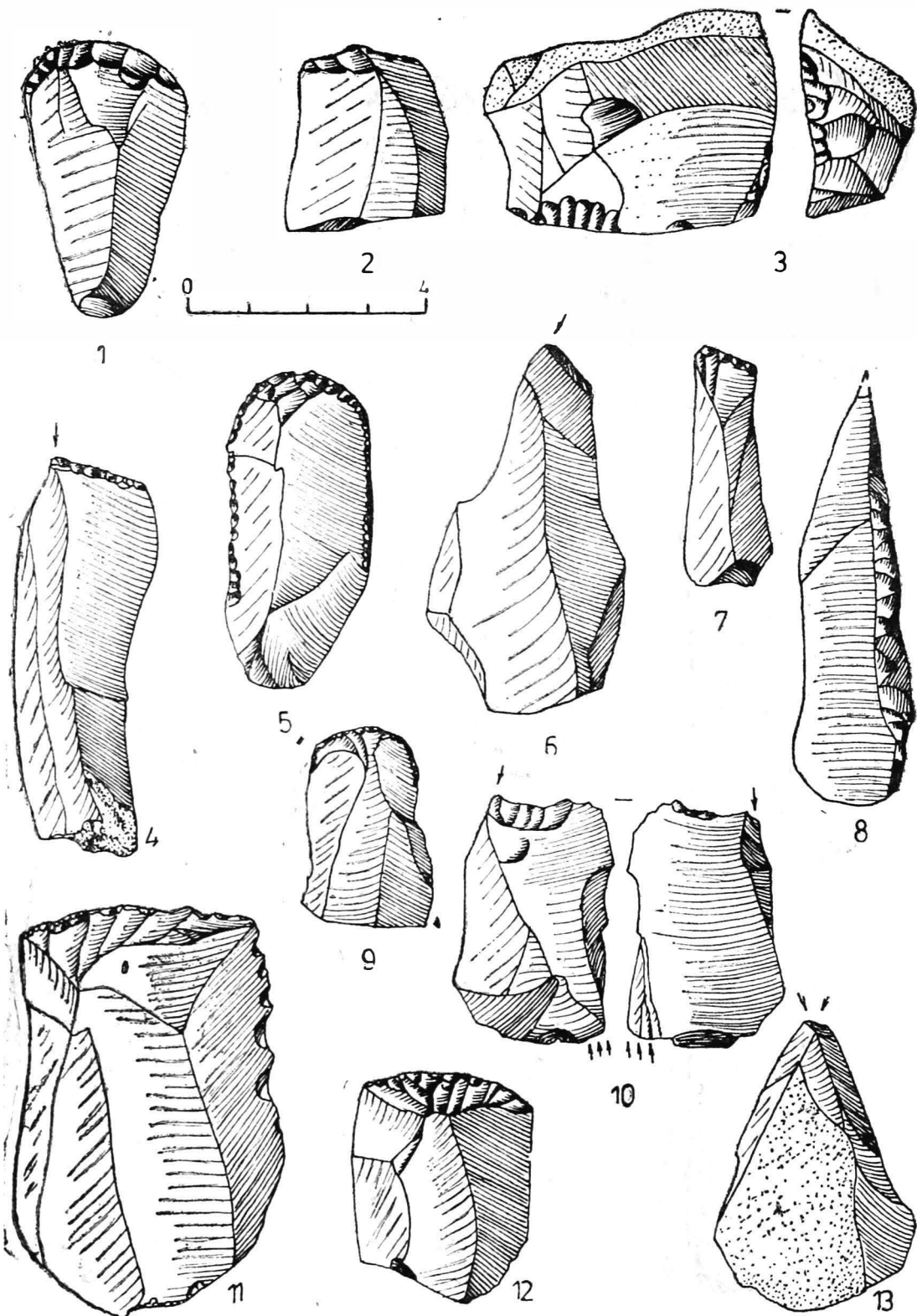


Fig. 11 — Cotu Miculintzi : 1—4, level I ; 5—8, level II ; 9—13, level III (after M. Brudiu).

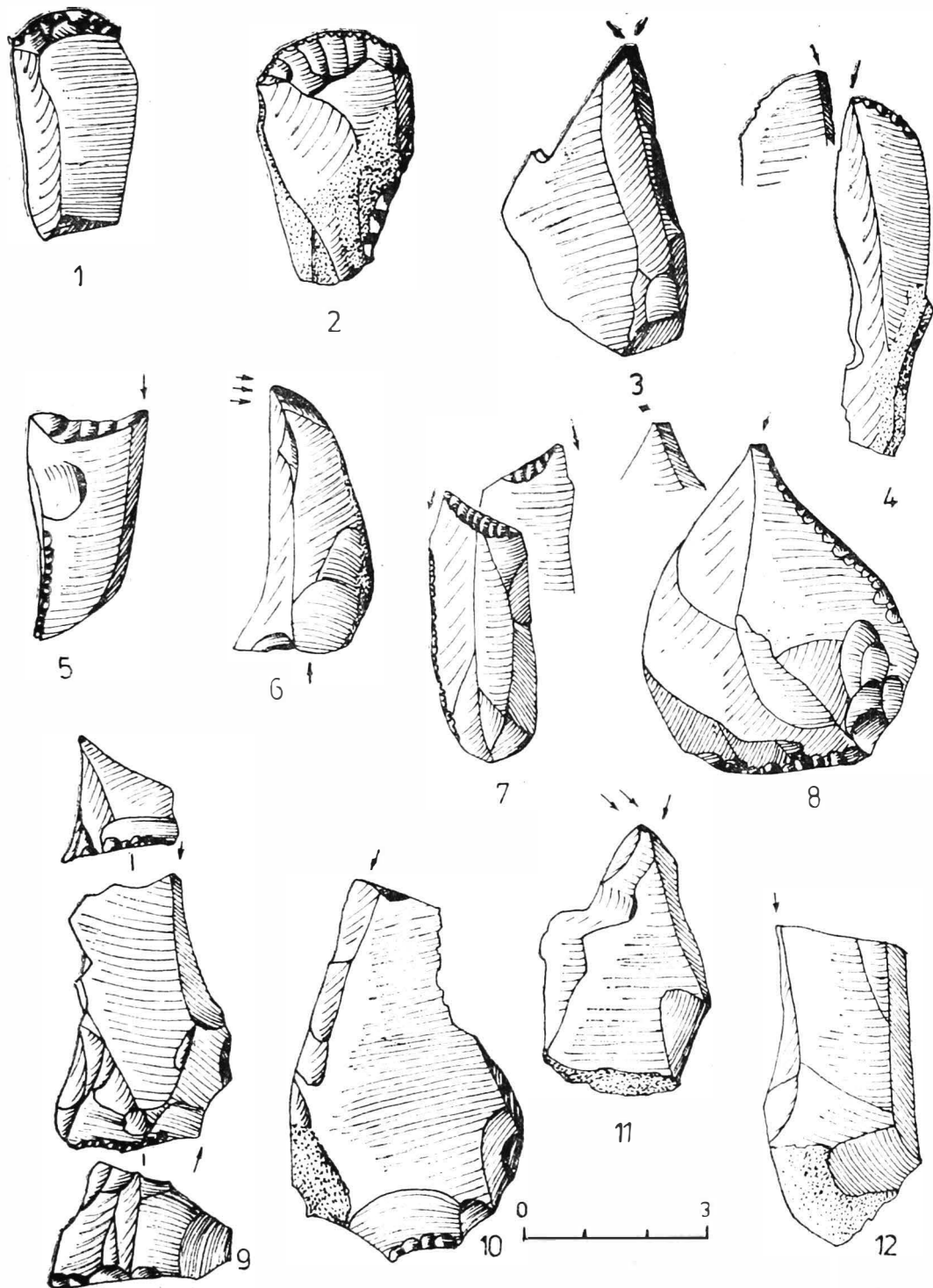


Fig. 12 — Cotu Miculinți: 1-2, level III (after M. Brudiu).

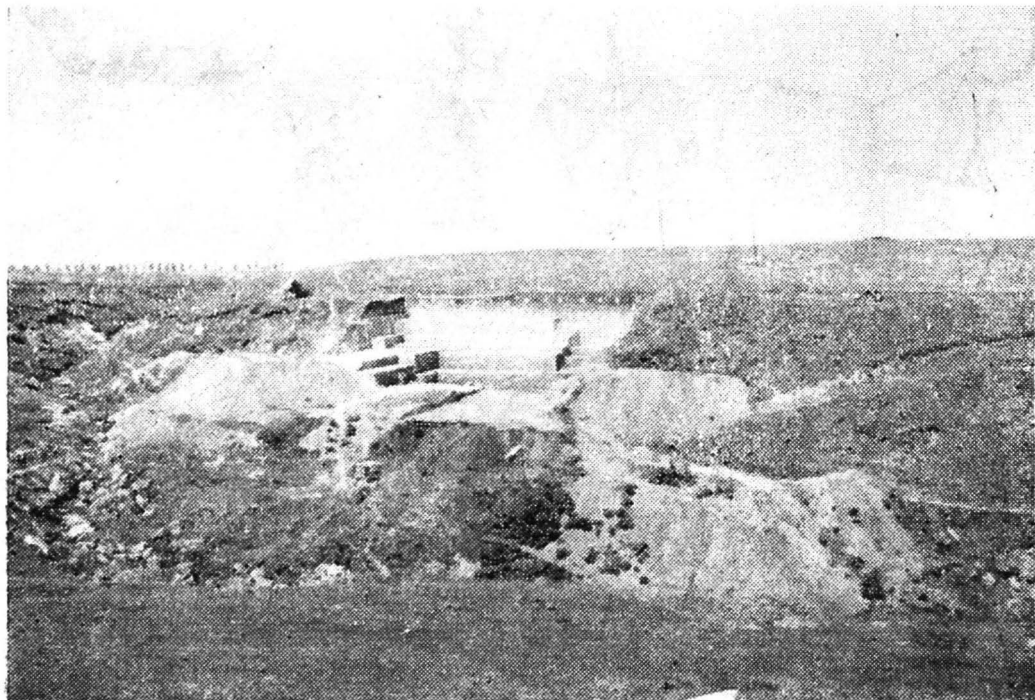
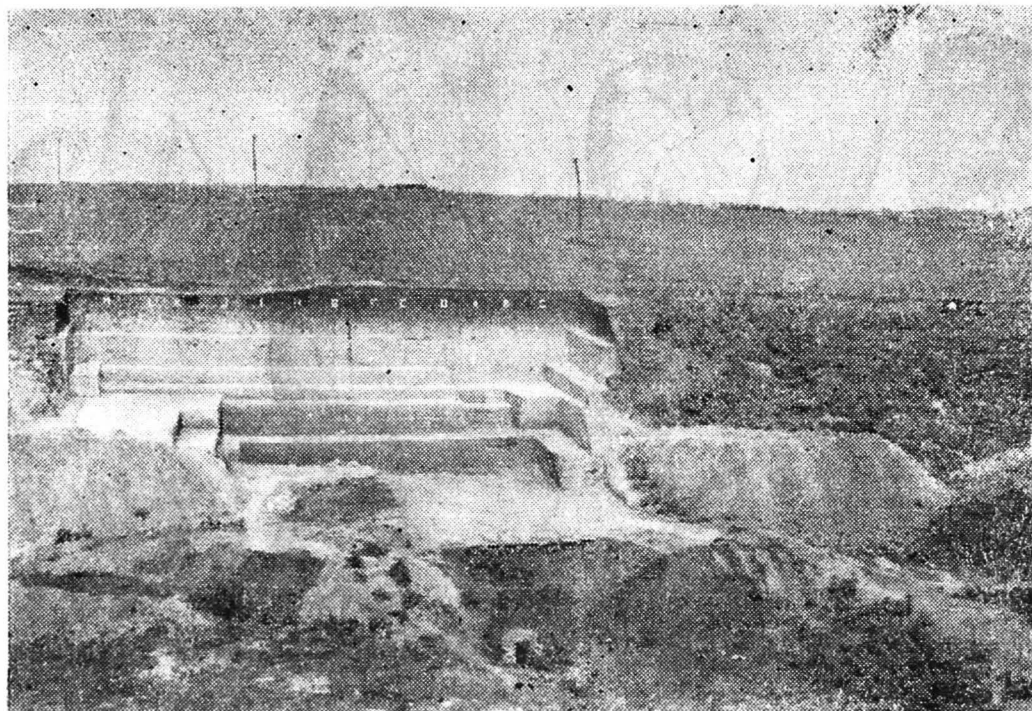


Fig. 13 -- Mitoc-Piriul lui Istrati, General View.

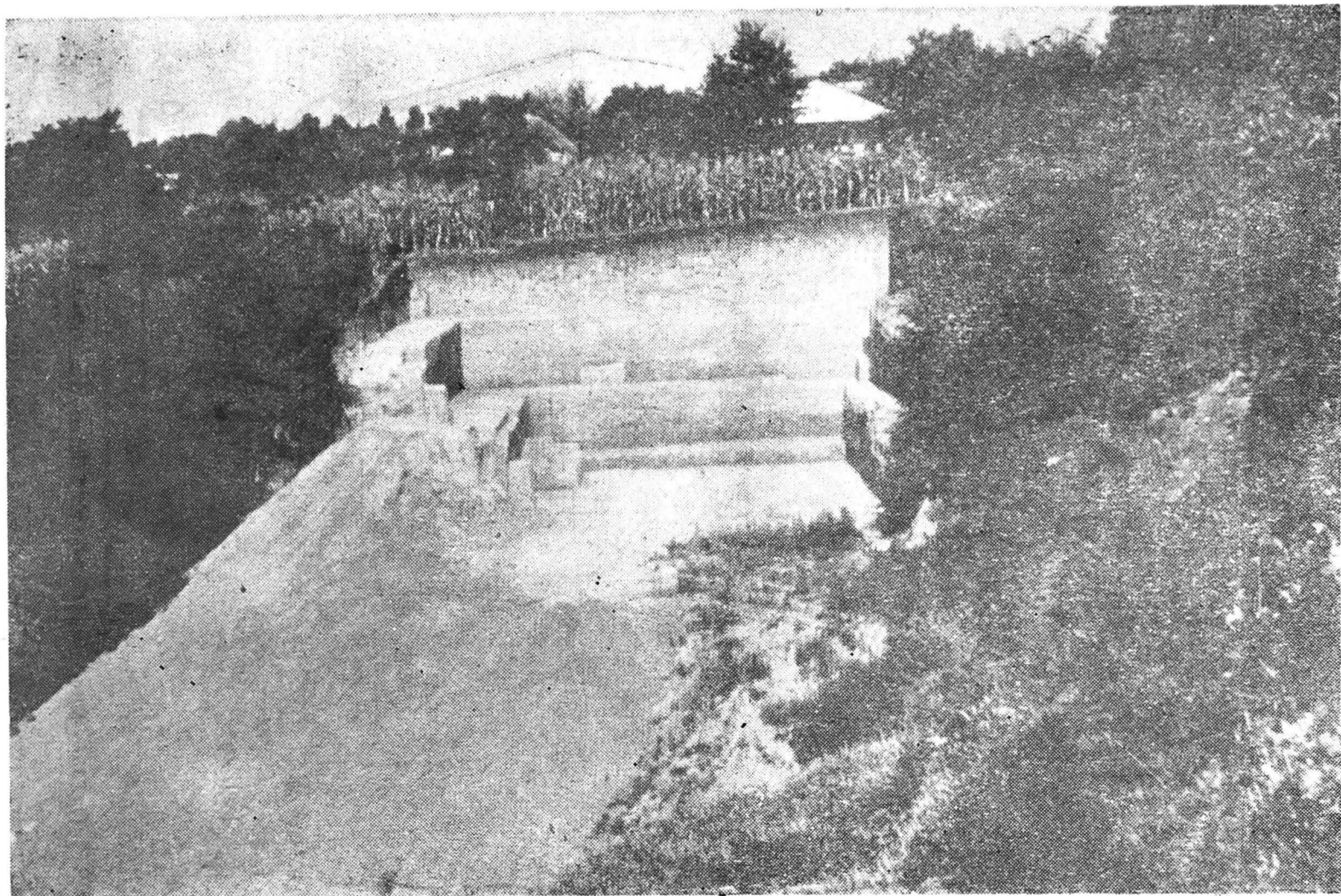


Fig. 14 — Mitoc-Malul Galben. General View (Photo by K. Honca, 1985),
<https://biblioteca-digitala.ro>

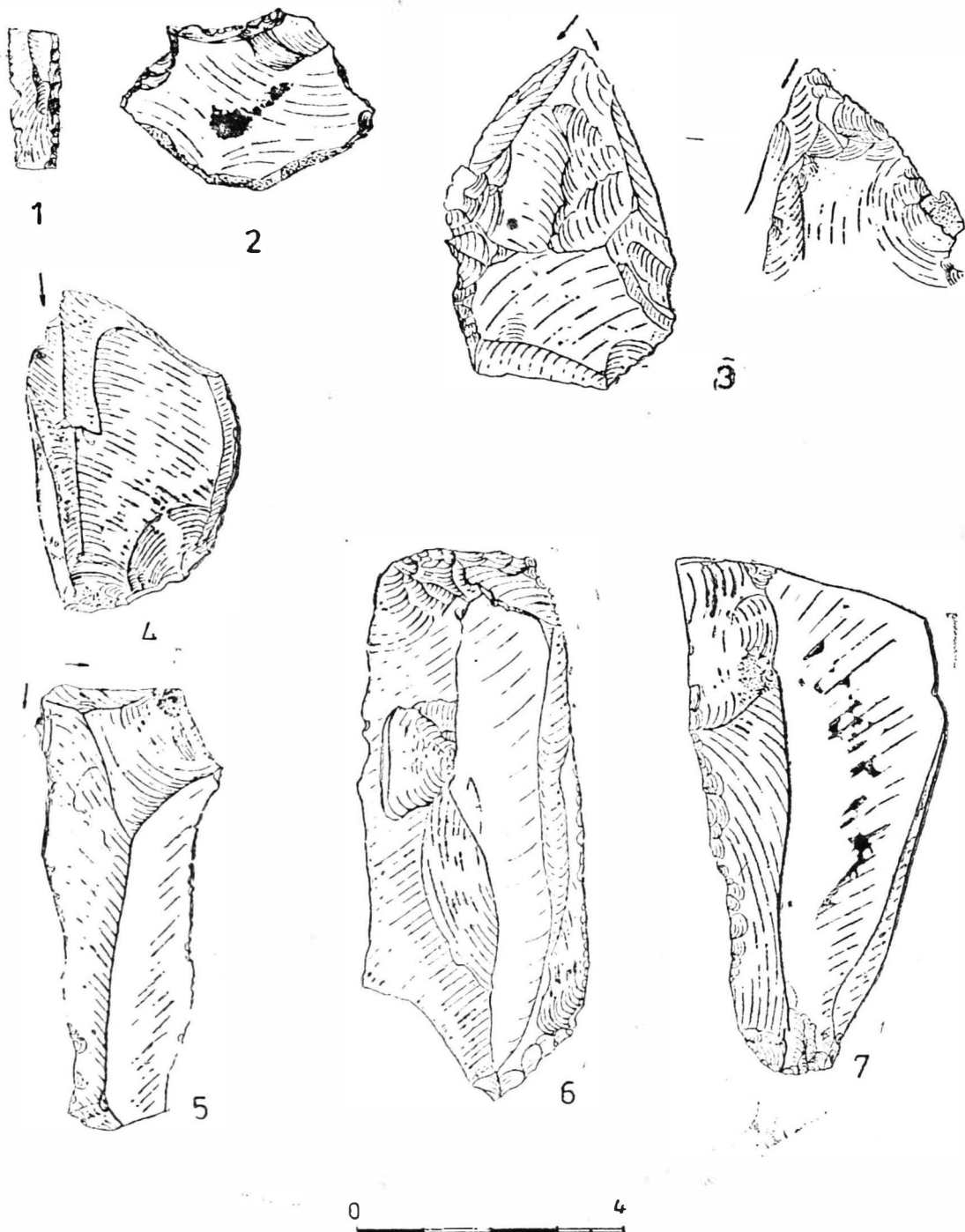


Fig. 15 — Mitoc-Malul Galben. Silex Objects from Older Excavations.

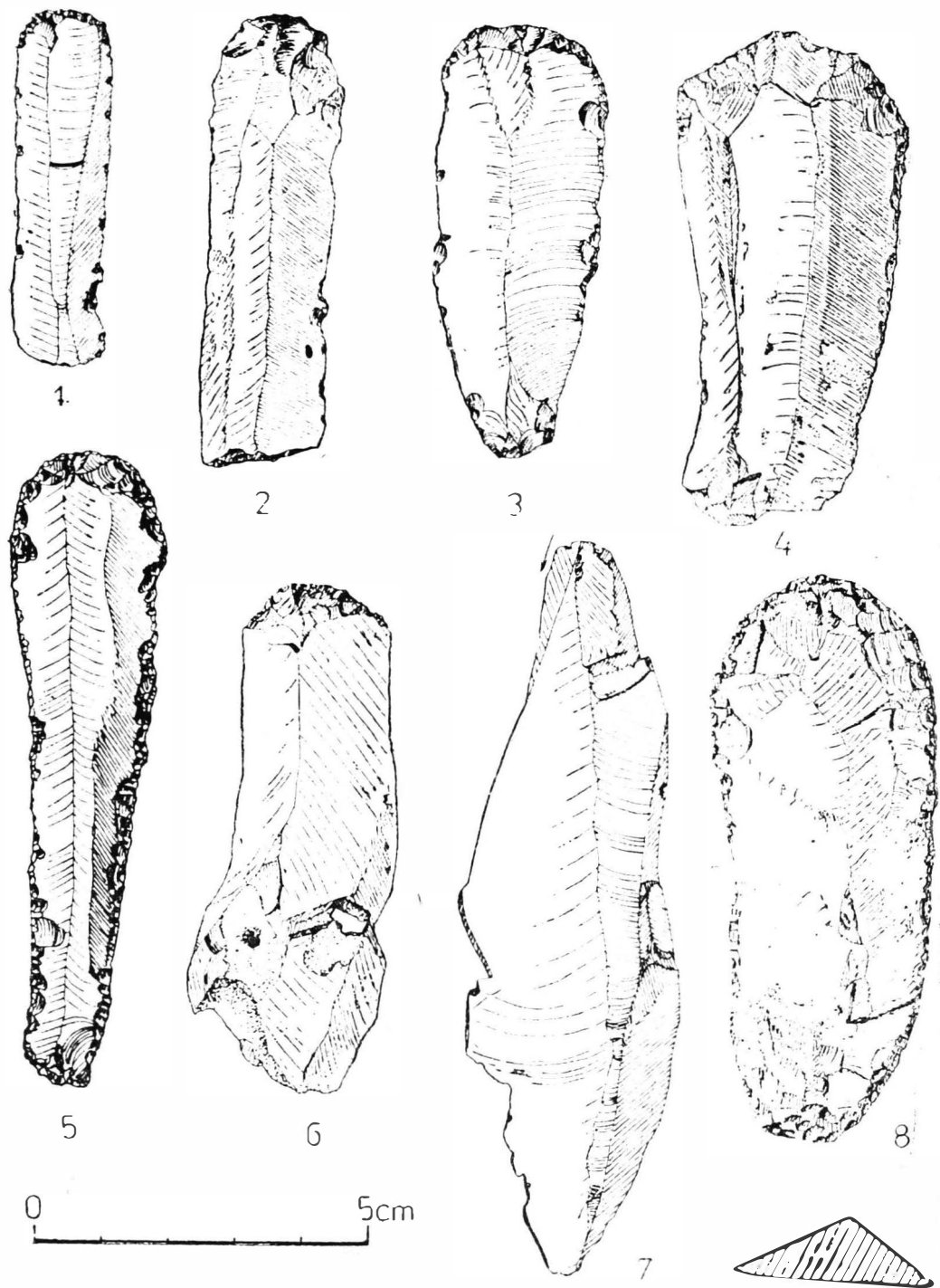


Fig. 16 — Mitoc-Malul Galben : 1, 2, level III ; 3-6, level II ; 7, level III.

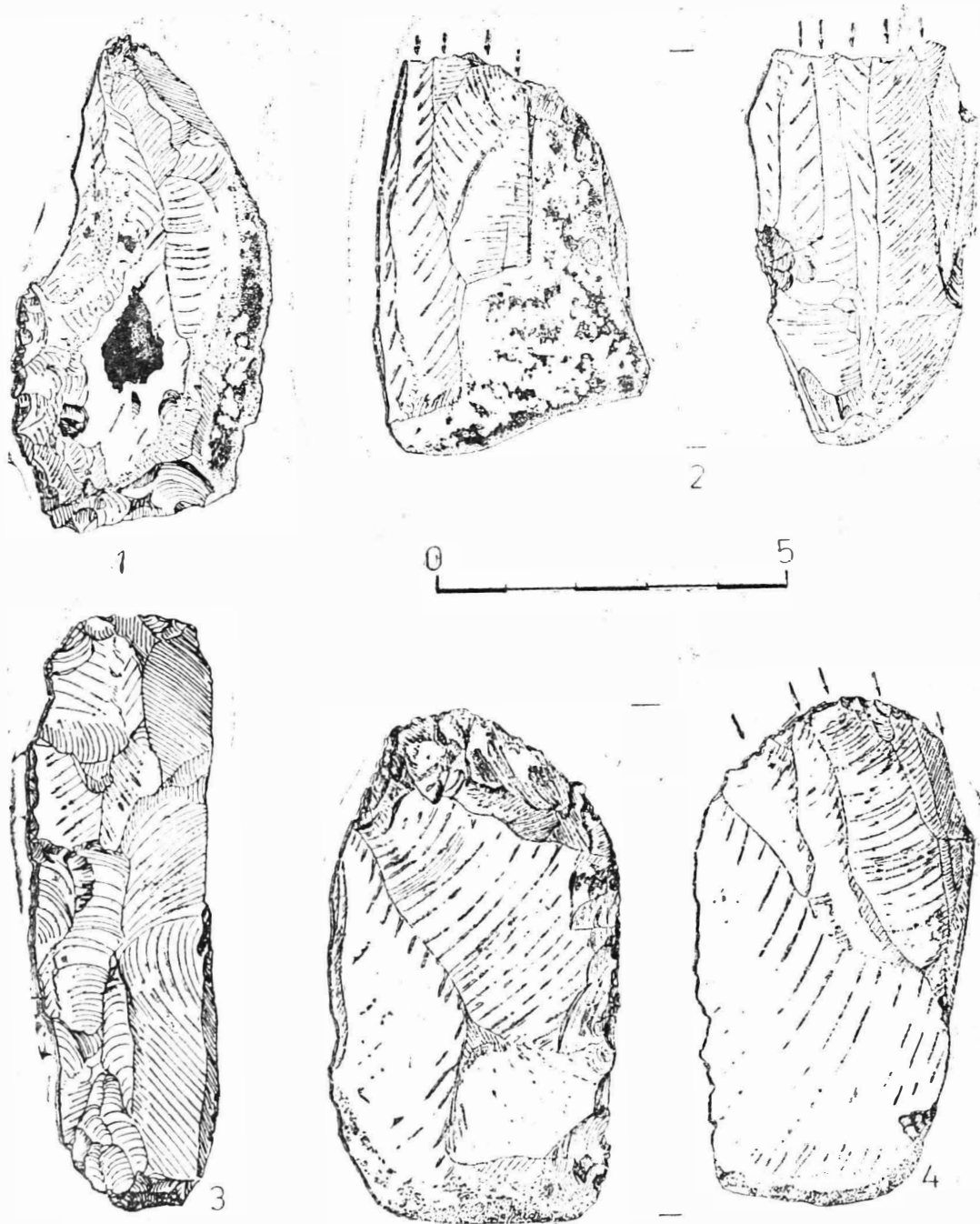


Fig. 17 — Mitoc-Malul Galben : 1, level V ; 2—4, level II.

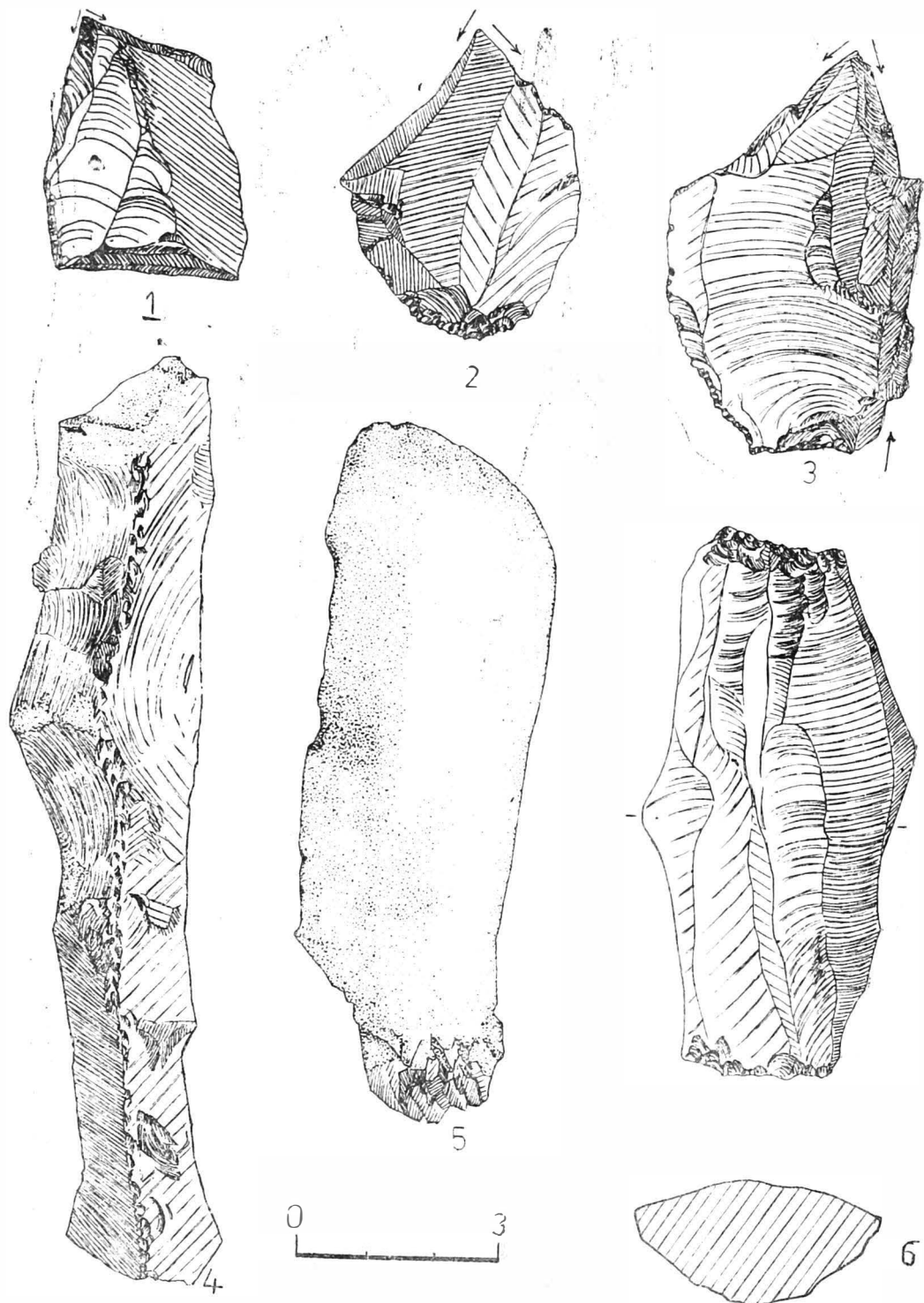


Fig. 18 — Mitoc-Malul Galben : 1, level II ; 2, 3, level V ; 4—6, level IV.

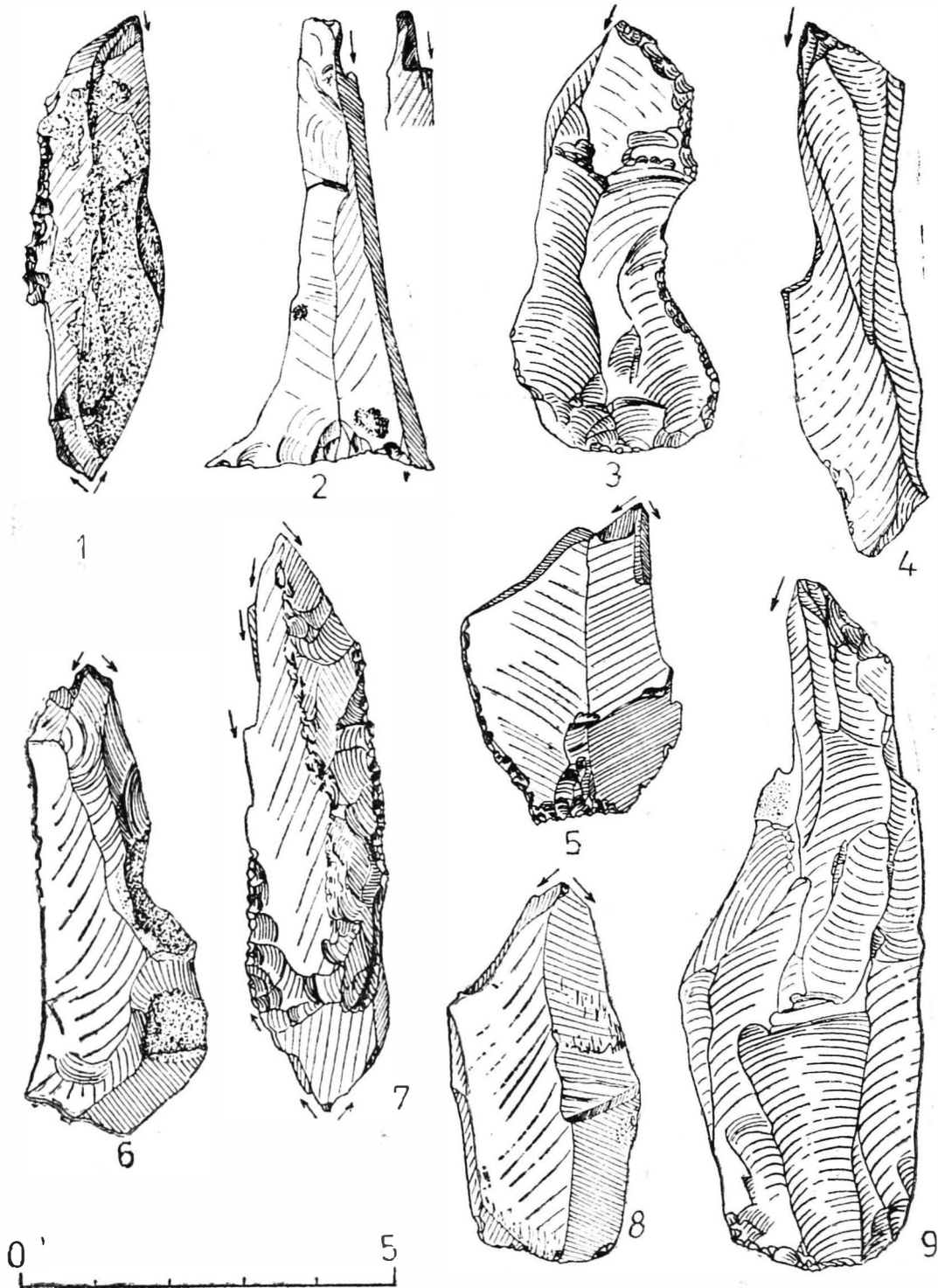


Fig. 19 — Mitoc-Malul Galben : 1—9, level V.

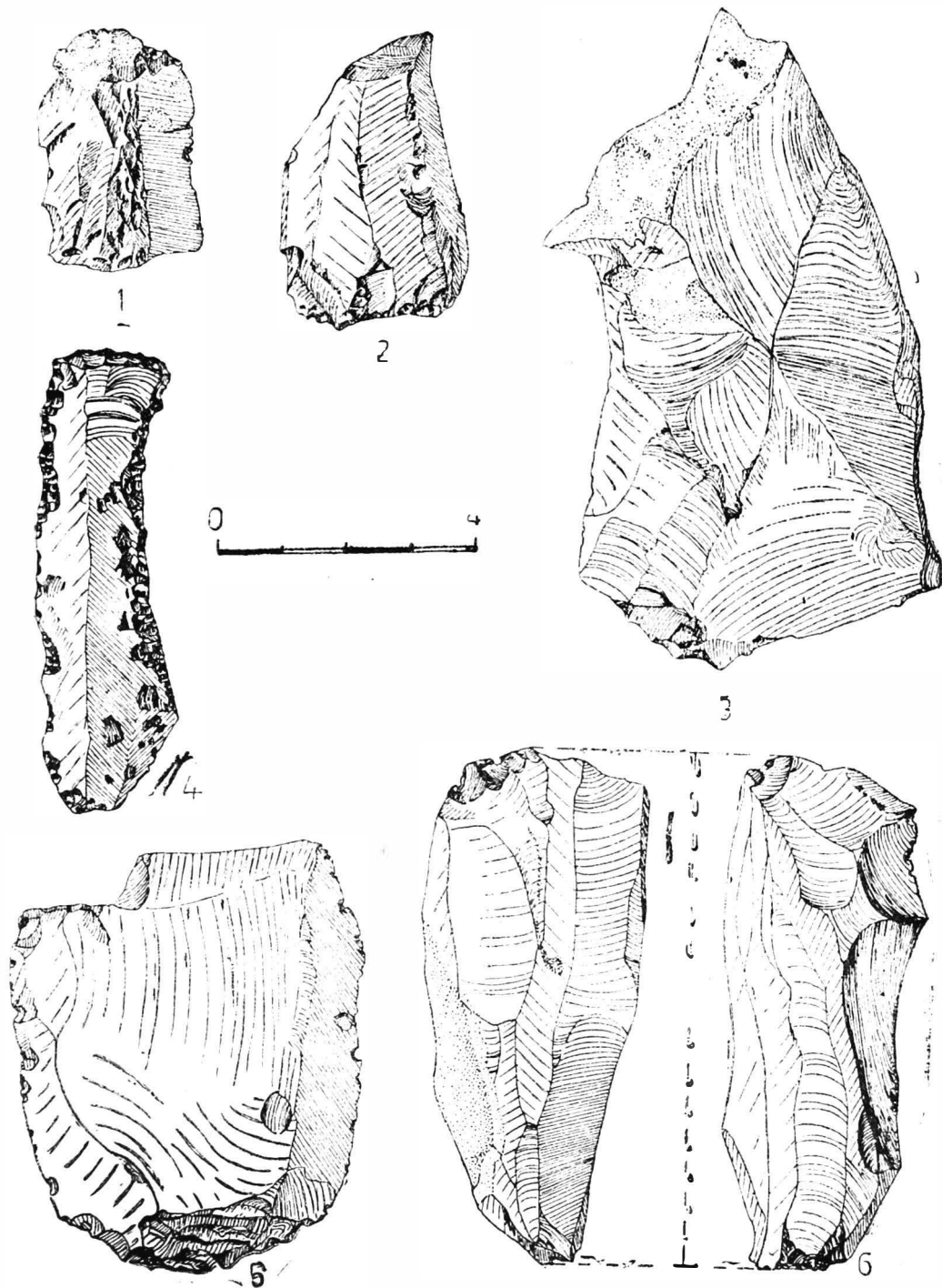


Fig. 20 — Mitoc-Malul Galben : 1, 4, 6, level IV ; 2, level V ; 3, level III ; 5, level II.

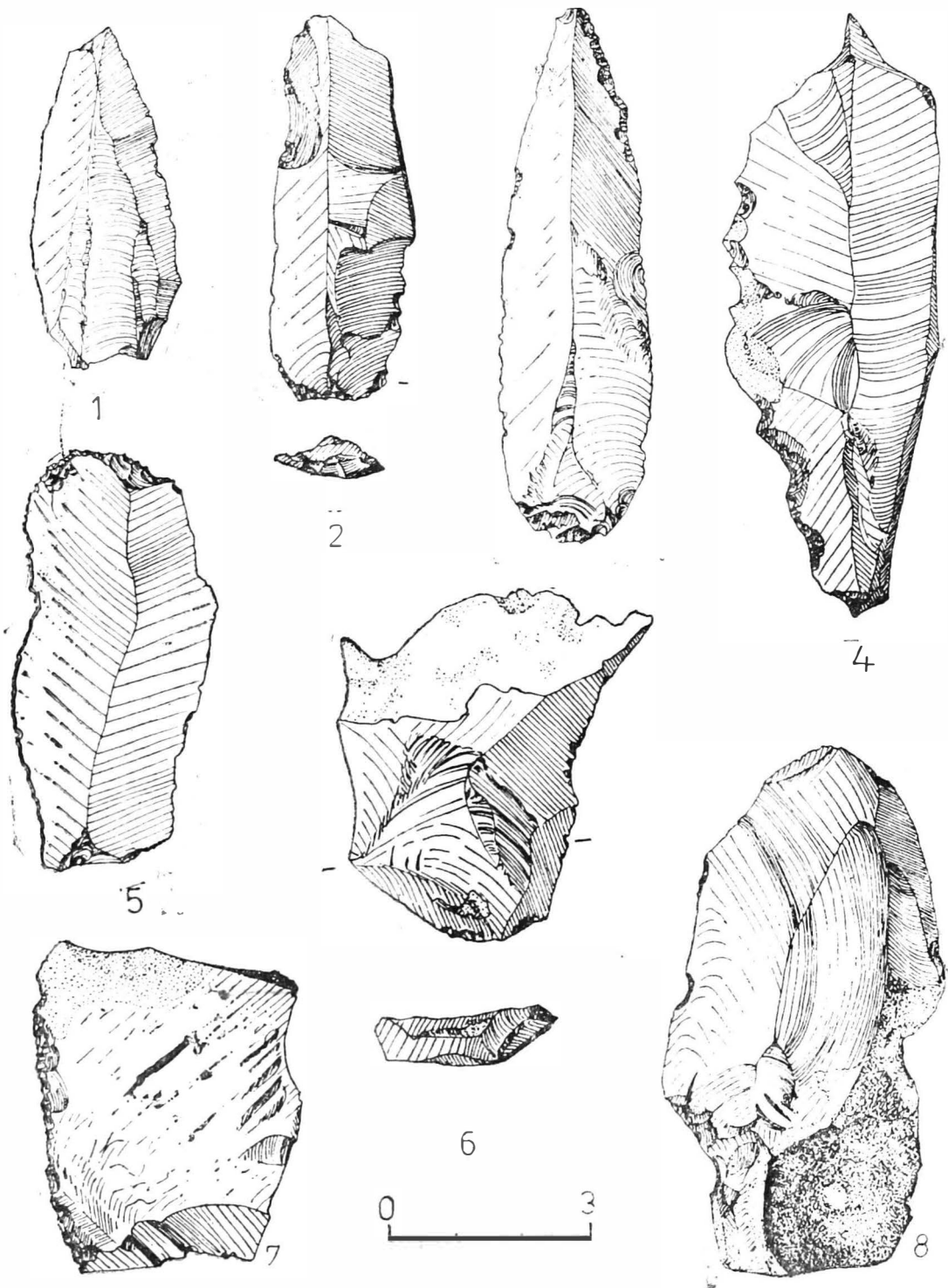


Fig. 21 — Mitoc-Malul Galben (1–5, 7, 8) and Piriul lui Istrati (6): 1, 3, 5, 8, level II; 2, 4, level IV; 6, level I; 7, level V.



Fig. 22 - Mitoc-Malul Galben (1-4, 6) and Piriul lui Istrati (5): 1, level V; 2, 3, 6, level I
4, level II; 5, level IV.

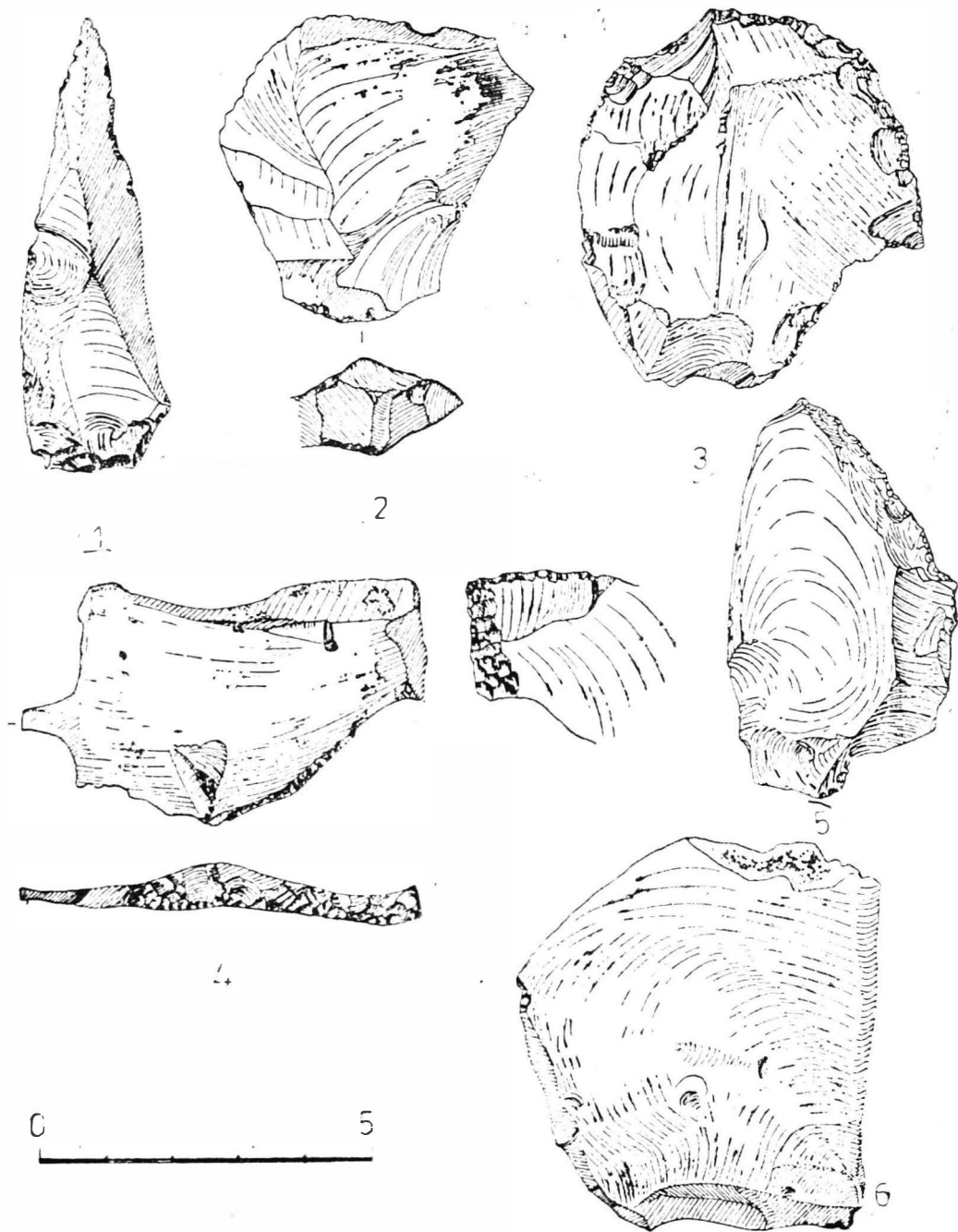


Fig. 23 — Mitoc-Malul Galben (1—4) and Pirlul lui Istrati (5—6): 1, level III; 2, level IV; 3, level II; 4, level V; 5, level II; 6, level I.

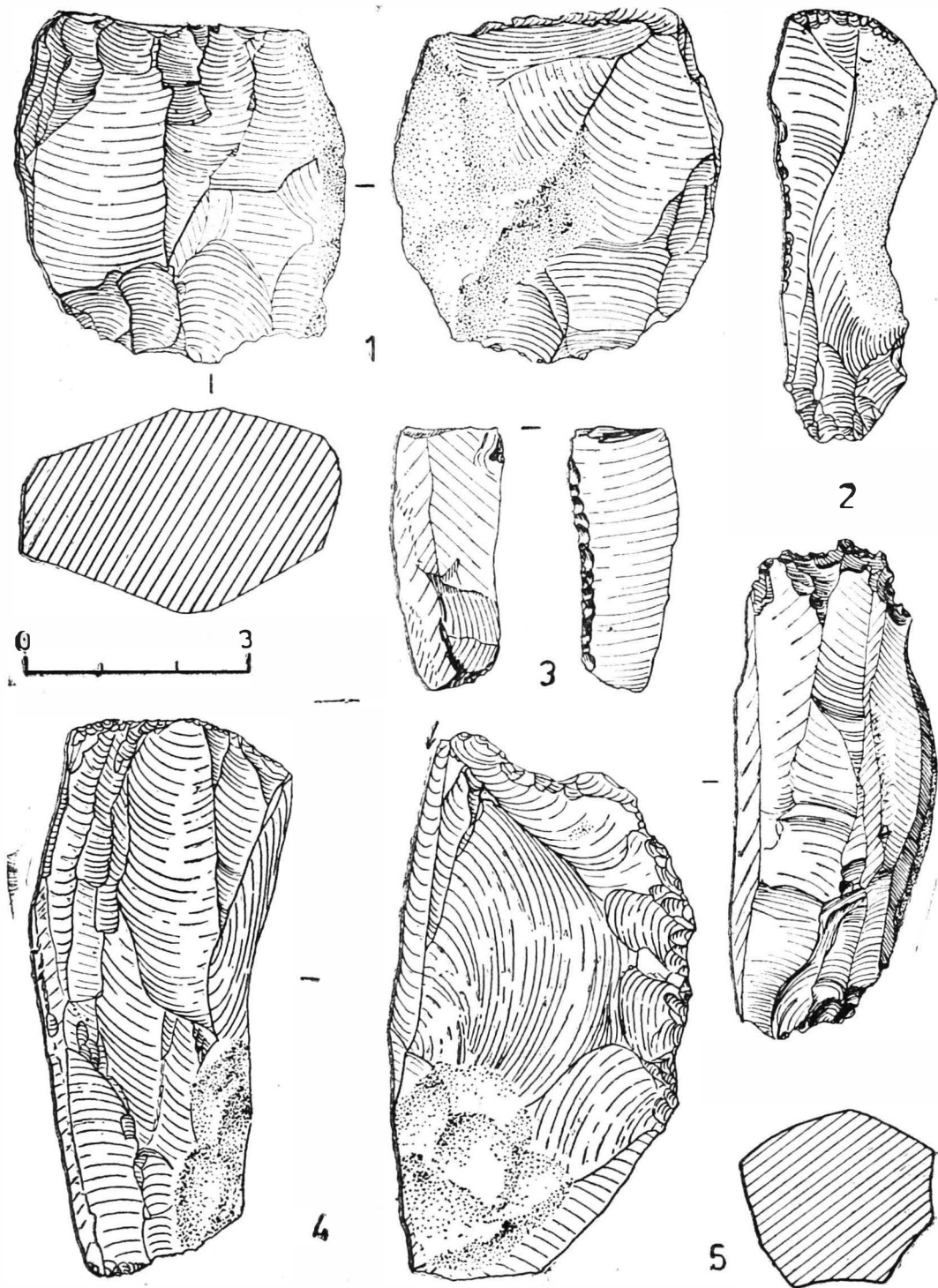


Fig. 24 — Mitoc-Piriul lui Istrati : 1—4, level II ; 5, level III.

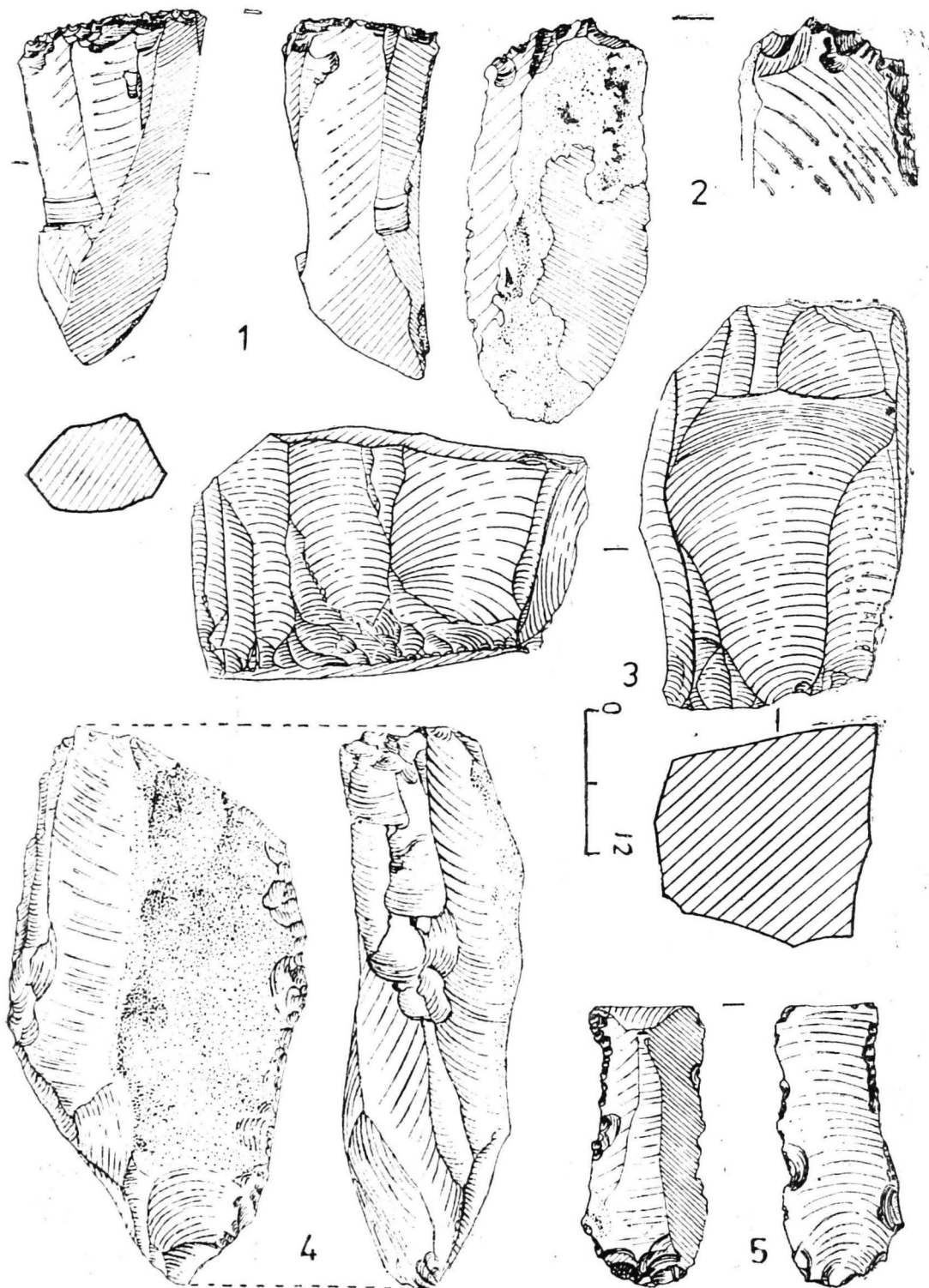


Fig. 25 — Mitoc-Piriul lui Istrati : 1, 5, level III ; 2—4, level II.

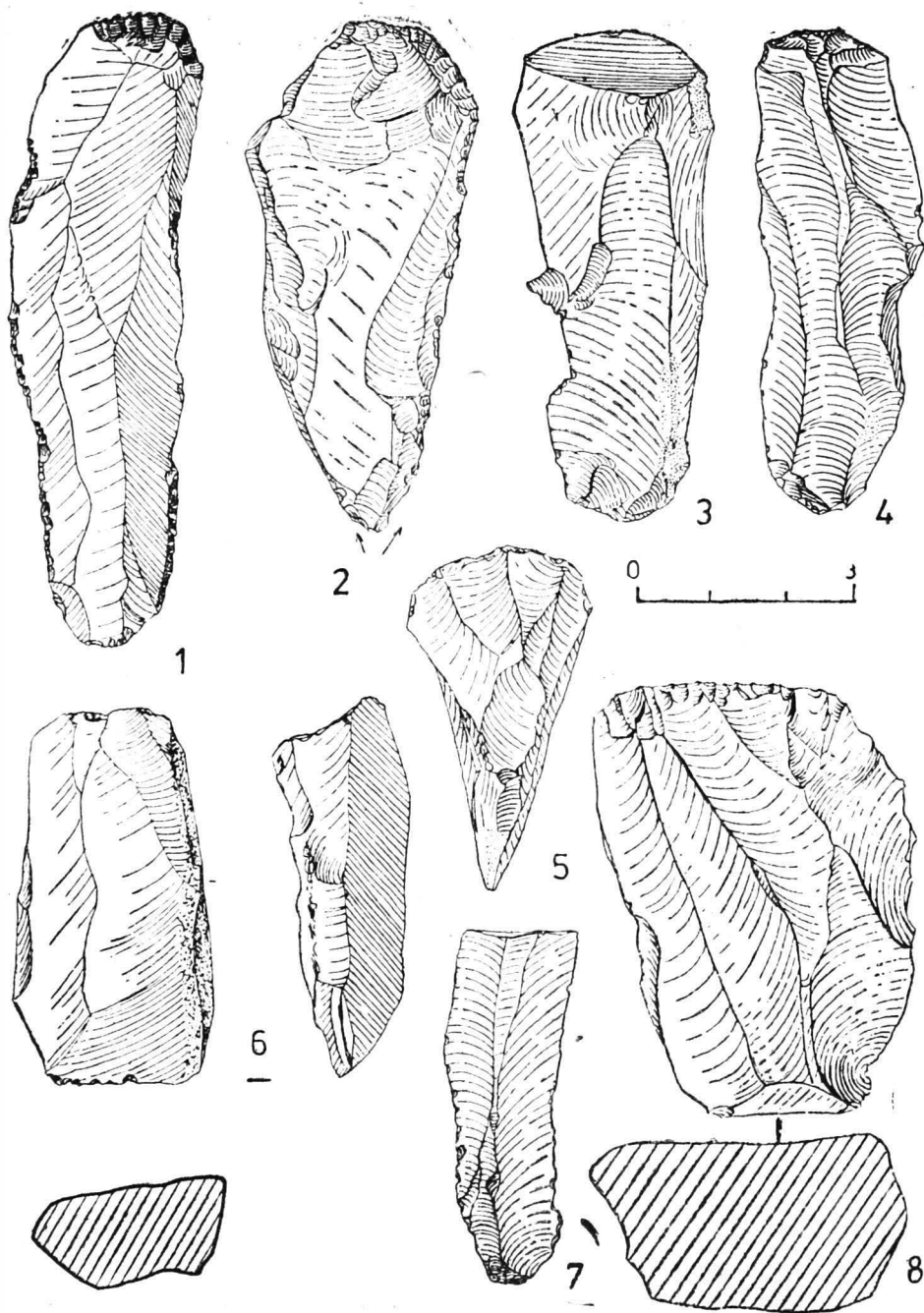


Fig. 26 — Mitoc-Pirlul lui Istrati : 1, 2, 7, level II ; 3, level IV ; 4-6, 8, level III.

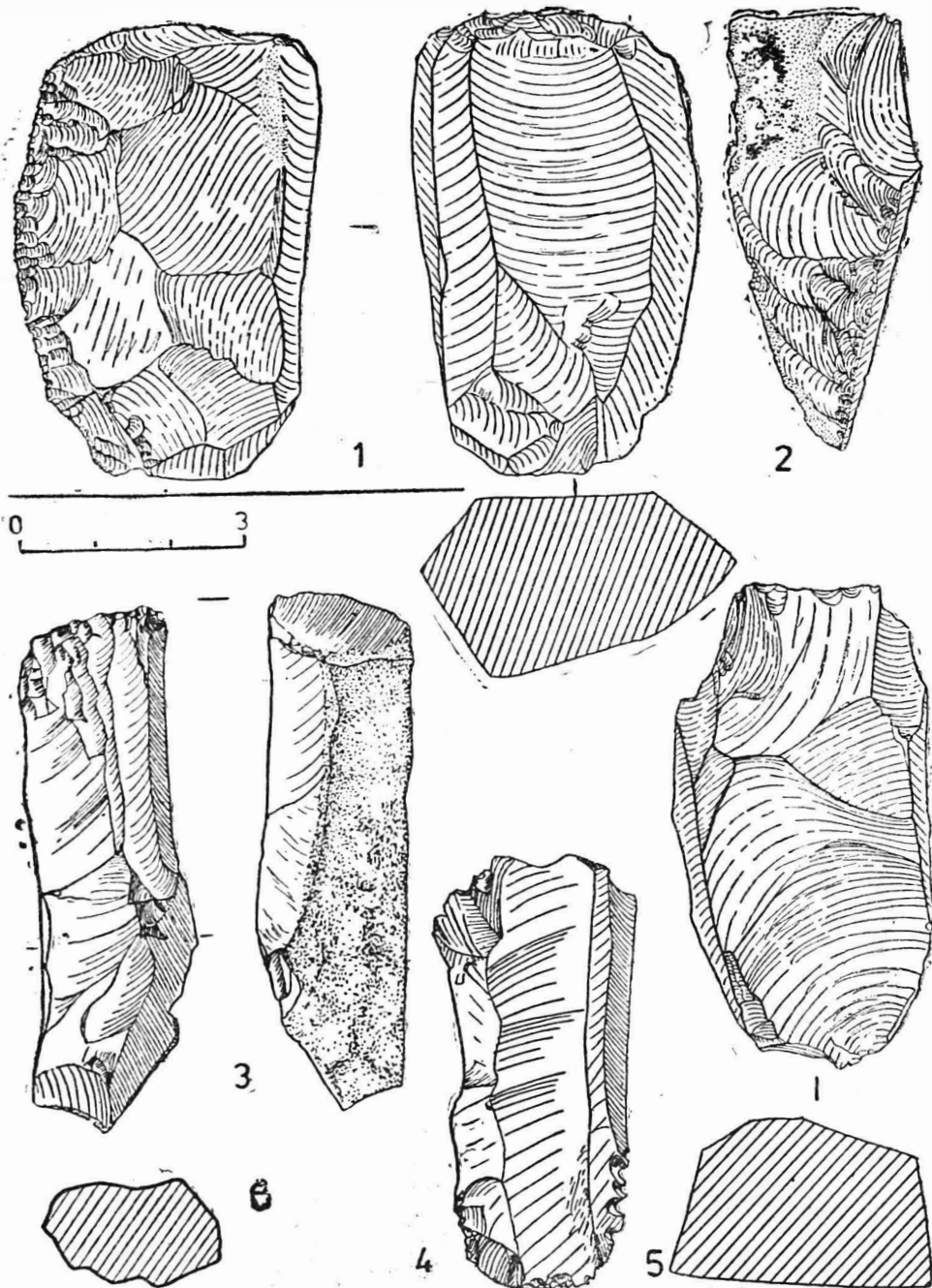


Fig. 27 — Mitoc-Pirlui lui Istrati : 1, 4, level II ; 2, 3, 5, level III.

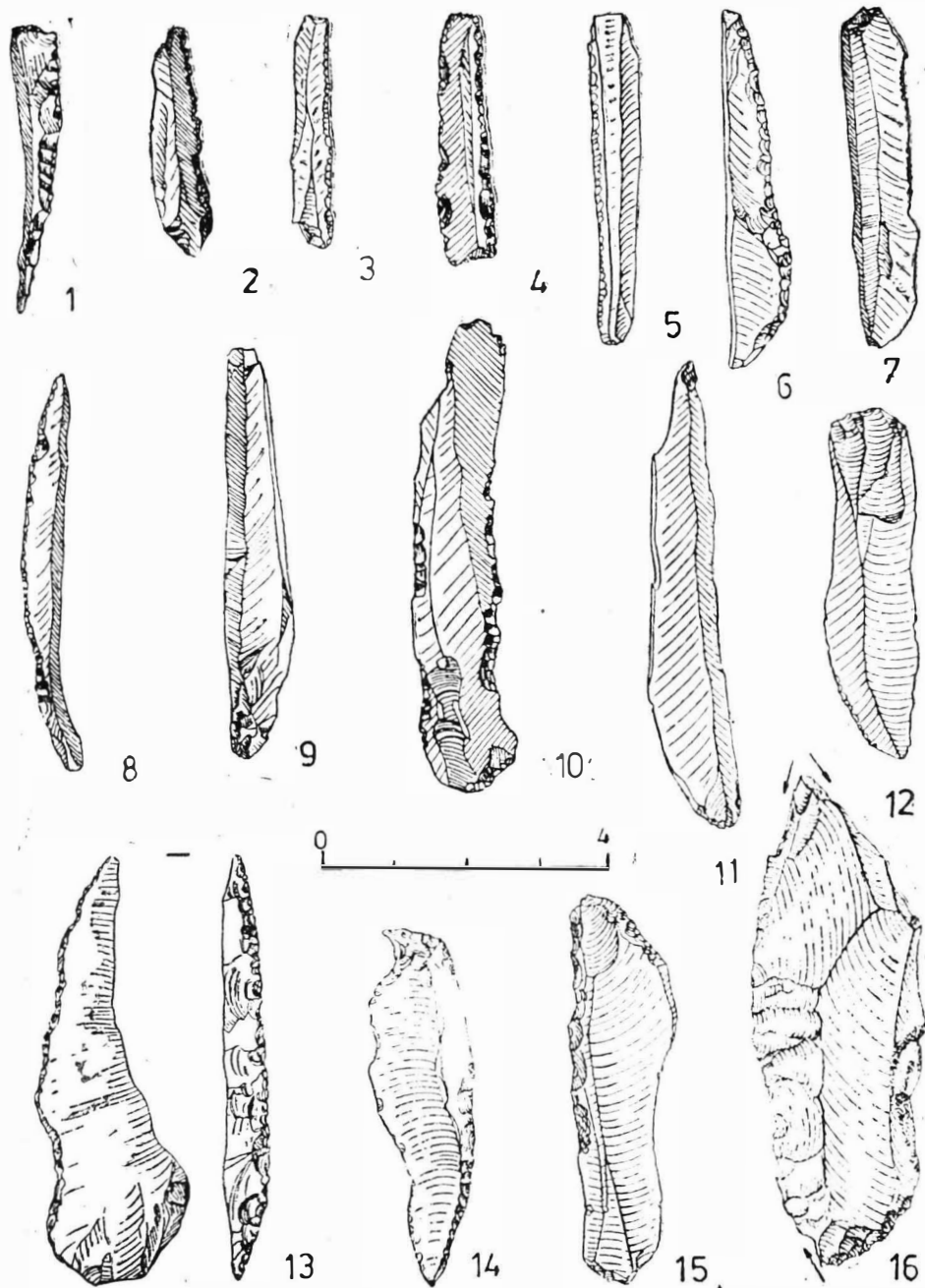


Fig. 28 — Mitoc-Piriul lui Istrati : 1, 2, 5, 6, 8—10, 12, 16, level II ; 3, 4, 7, 11, 18, 15, level III ; 14, level IV.

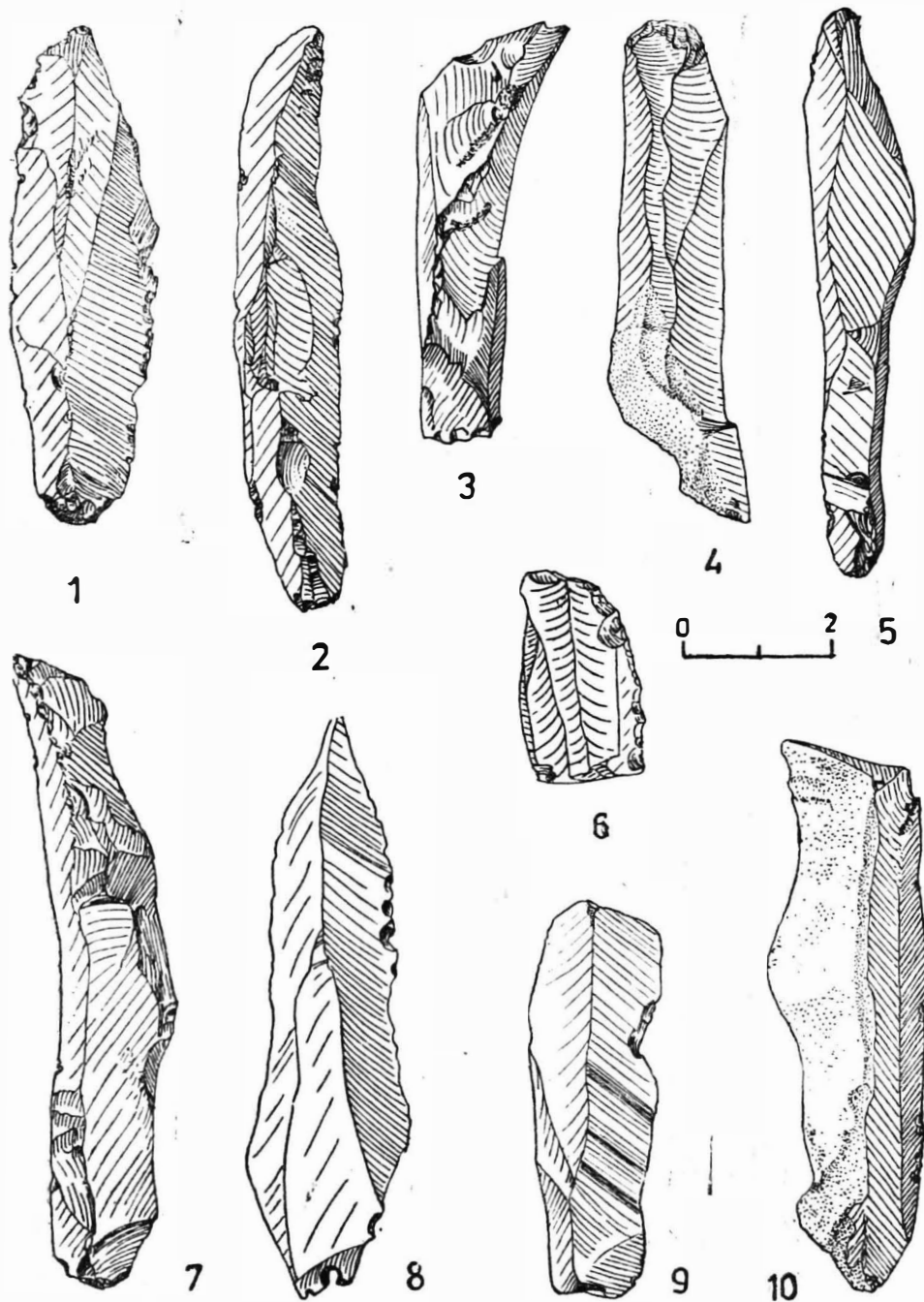


Fig. 29 — Mitoc-Piriul lui Istrati : 1, 3, 6 — 10, level III ; 2, 4, 5, level II.

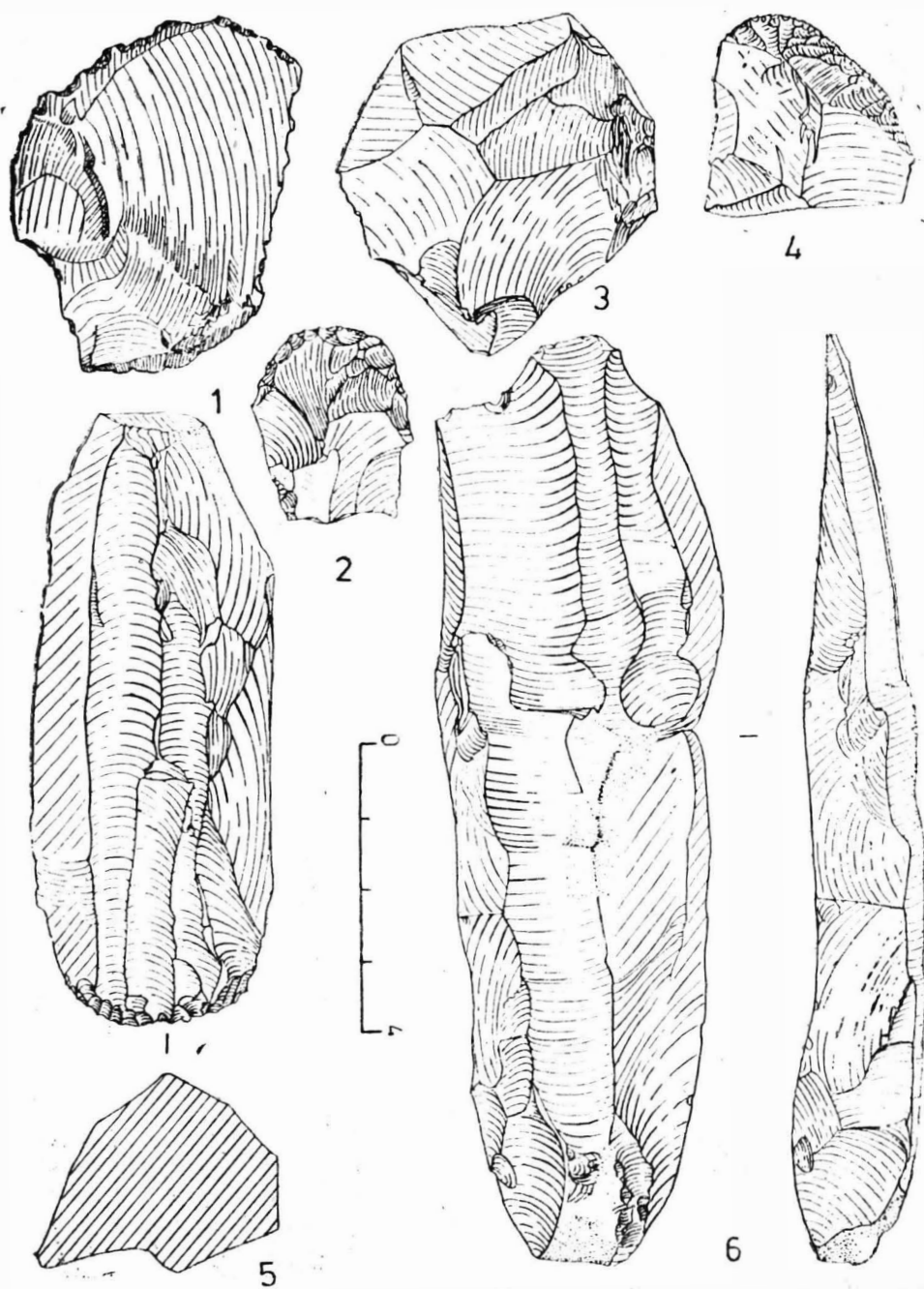


Fig. 30 — Mitoc-Pîriul lui Istrati : 1, 2, 4, level II; 3, level III; 5, 6, level IV.

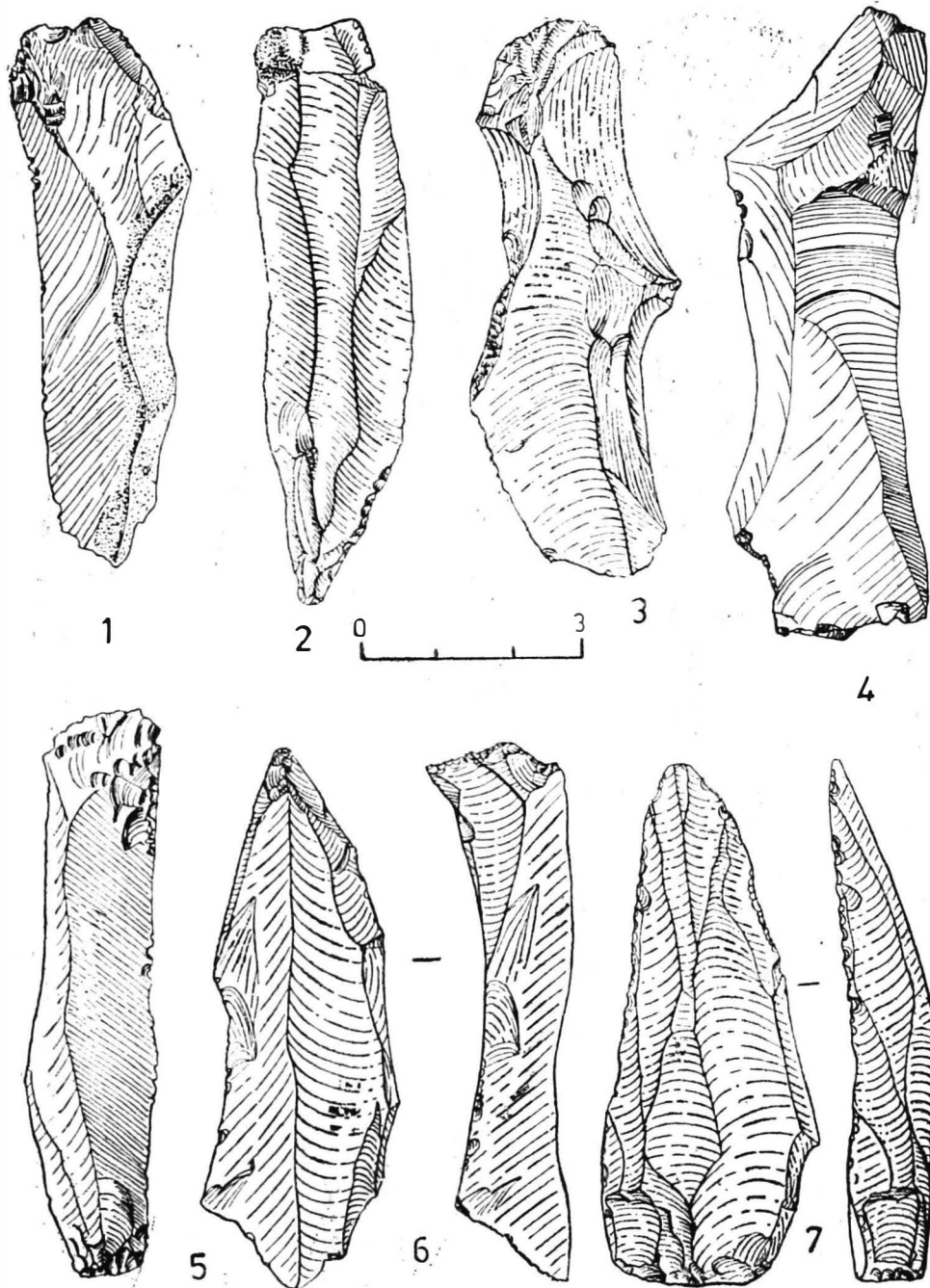


Fig. 31 — Mitoc-Pirlul lui Istrati : 1, 5, level II ; 2, level IV ; 3, 4, 6, 7, level III.

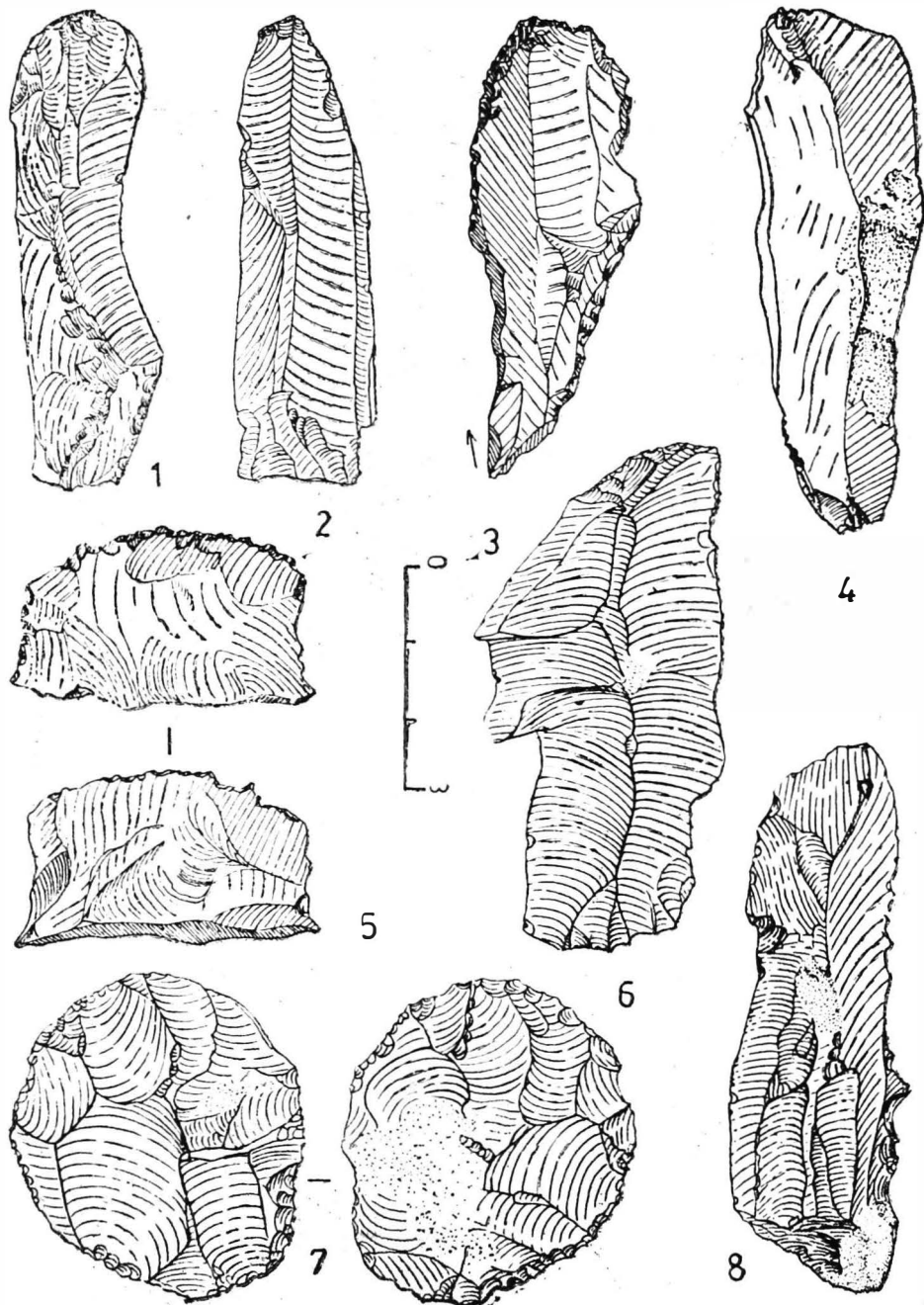


Fig. 32 — Mitoc-Piriul lui Istrati: 1, 5, level III; 2—4, 6—8, level II.

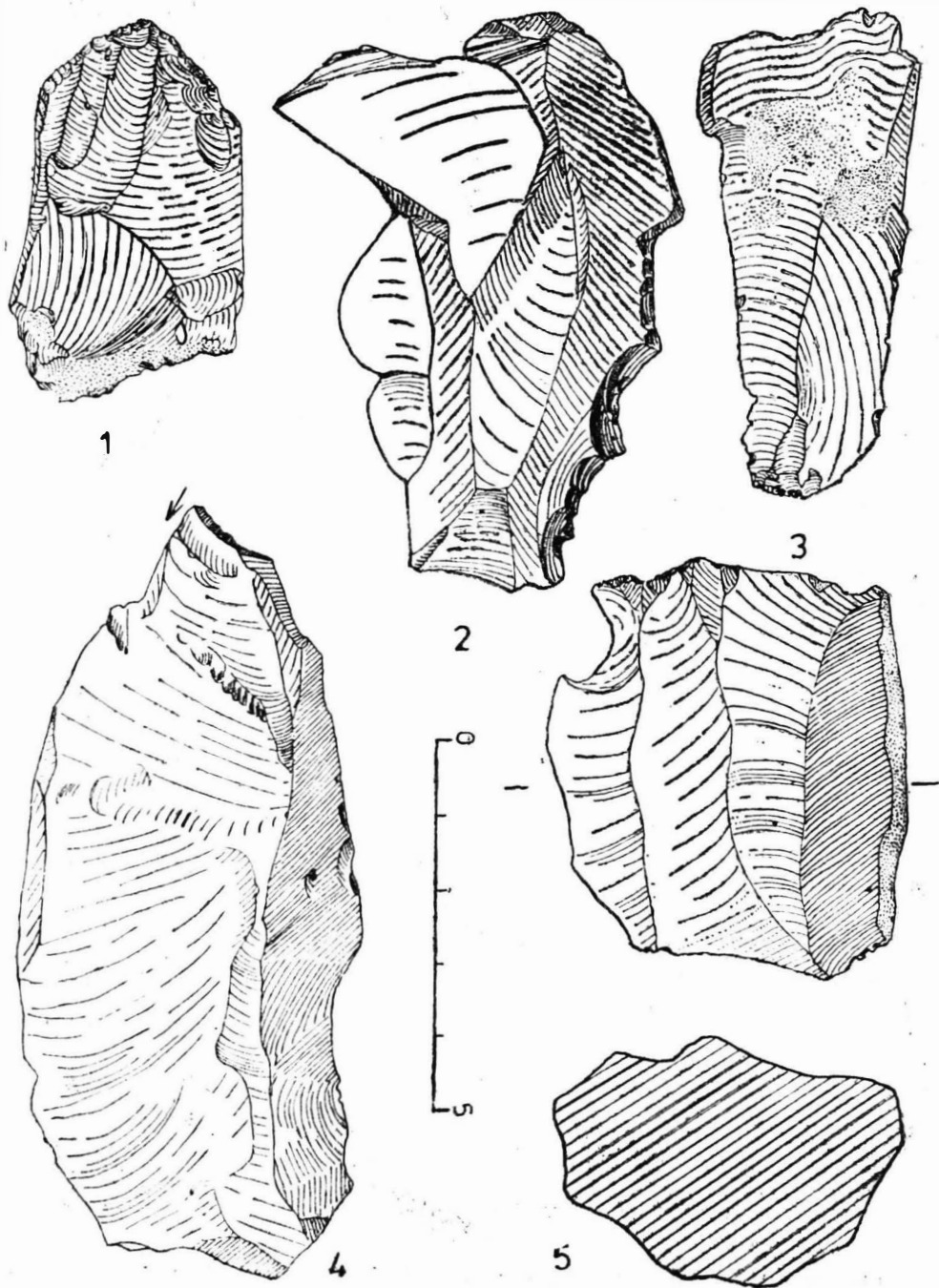


Fig. 33 — Mitoc-Pirlul lui Istrati: 1, 4, level II; 2, 3, 5, level III.

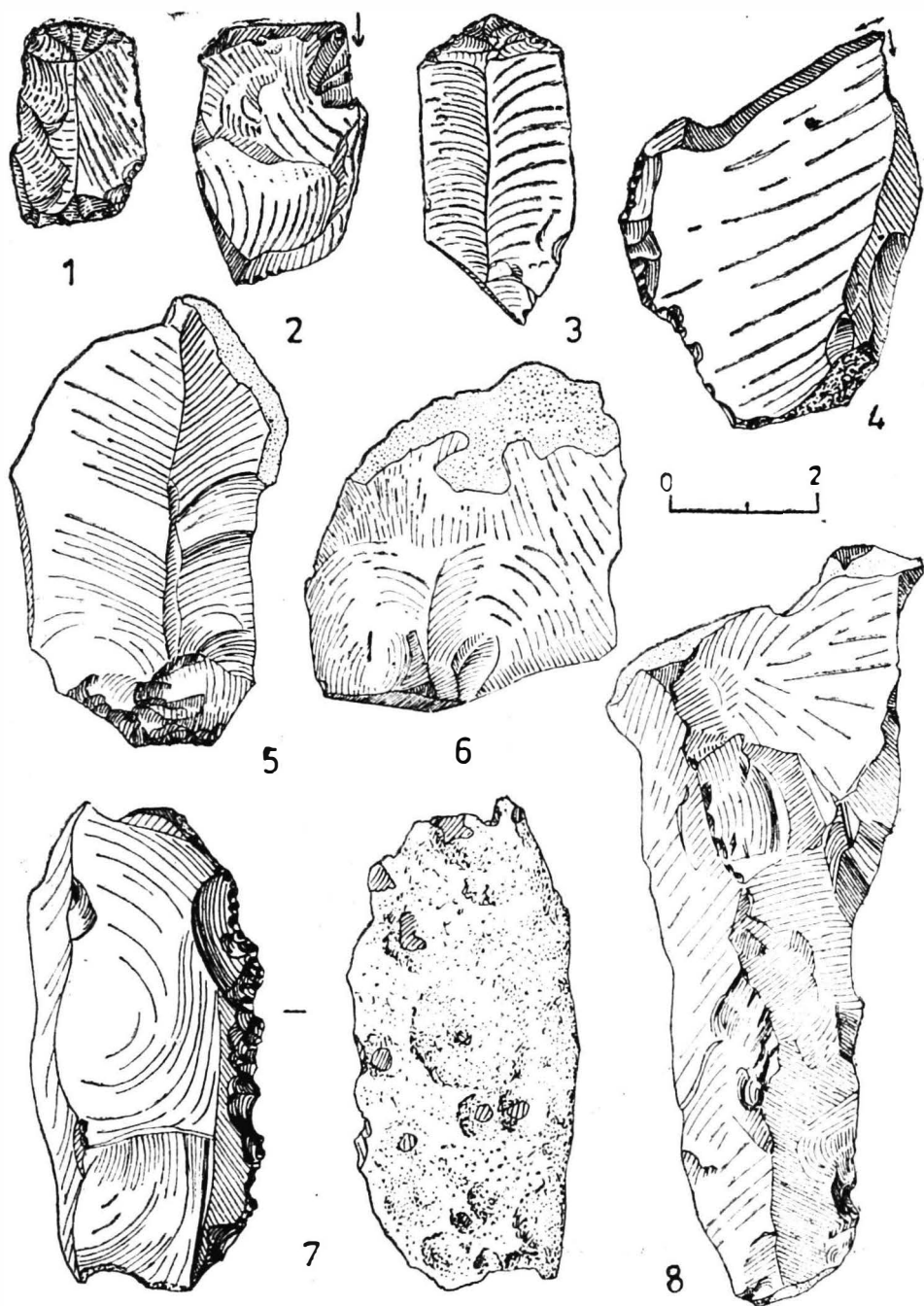


Fig. 34 — Mitoc-Piriul lui Istrati : 1, 2, 7, level III ; 3—6, level II.

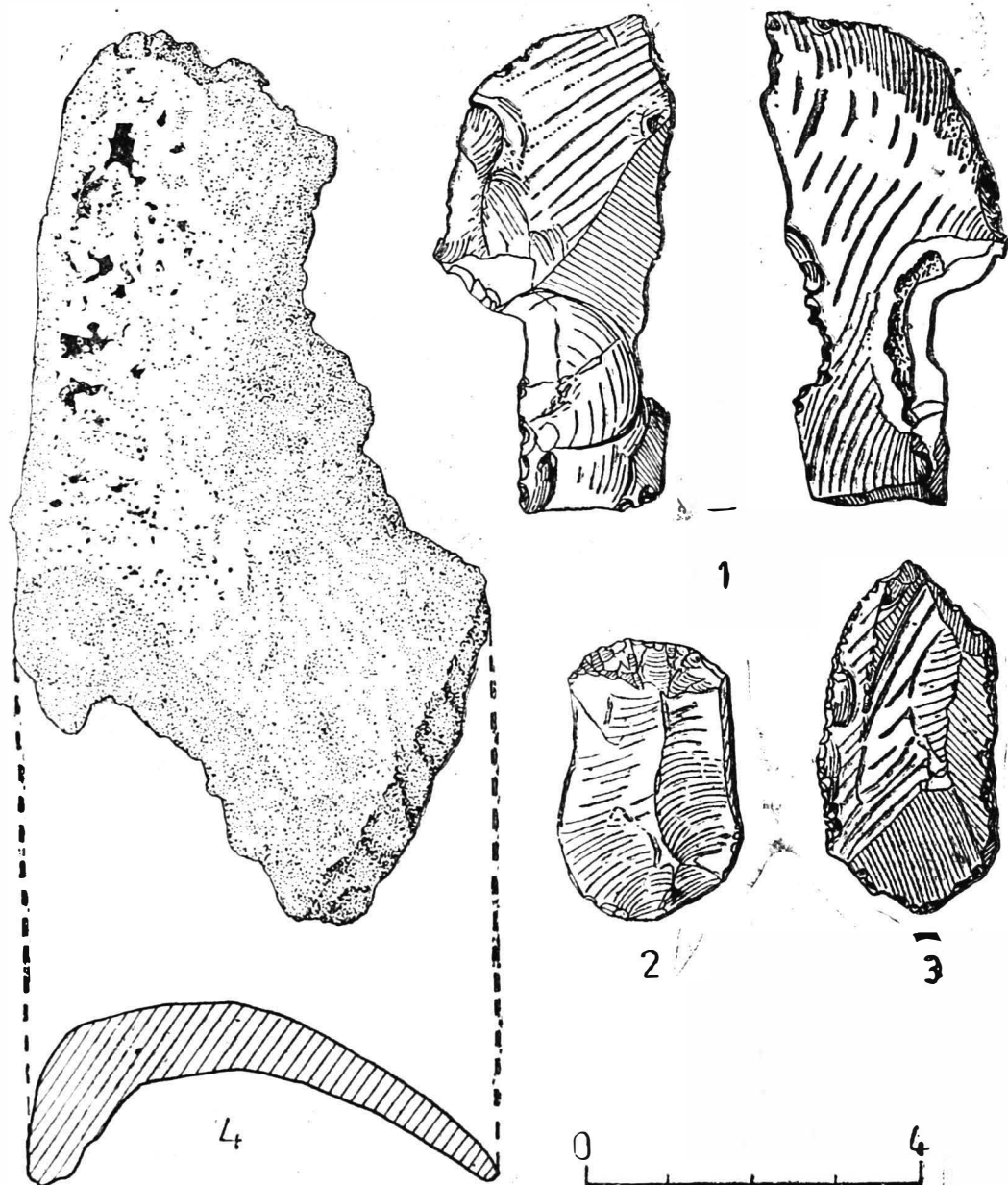


Fig. 35 — Mitoc-Pirîul lui Istrati. Silex (1—3) and horn (4) objects. 1, level III ; 2—4, level II.

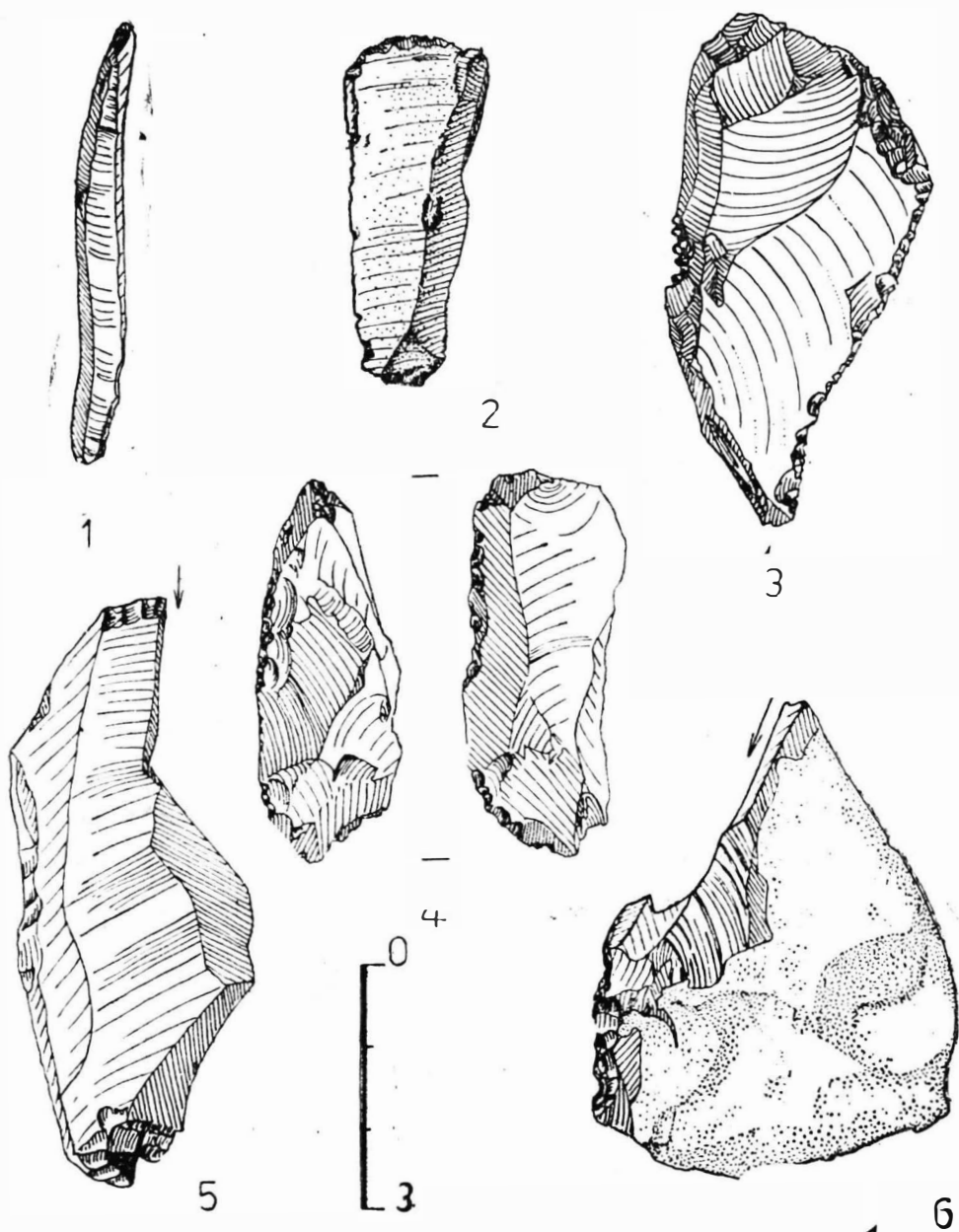


Fig. 36 — Mitoc-Piriul lui Istrati : 1, 3, level II ; 2, 4, 6, level III ; 5, level I, Aurignacian.

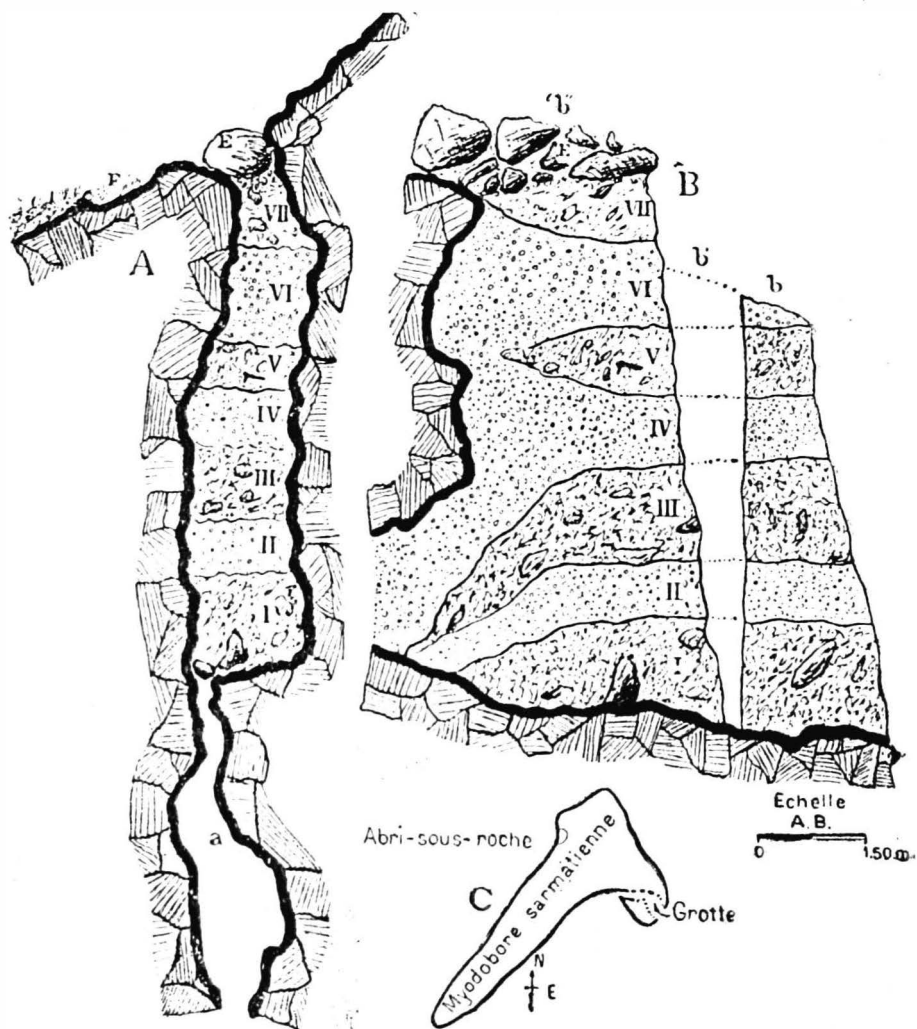


Fig. 37 — Rockshelter and cave at Stinca-Ripiceni (after N. N. Moroşan).

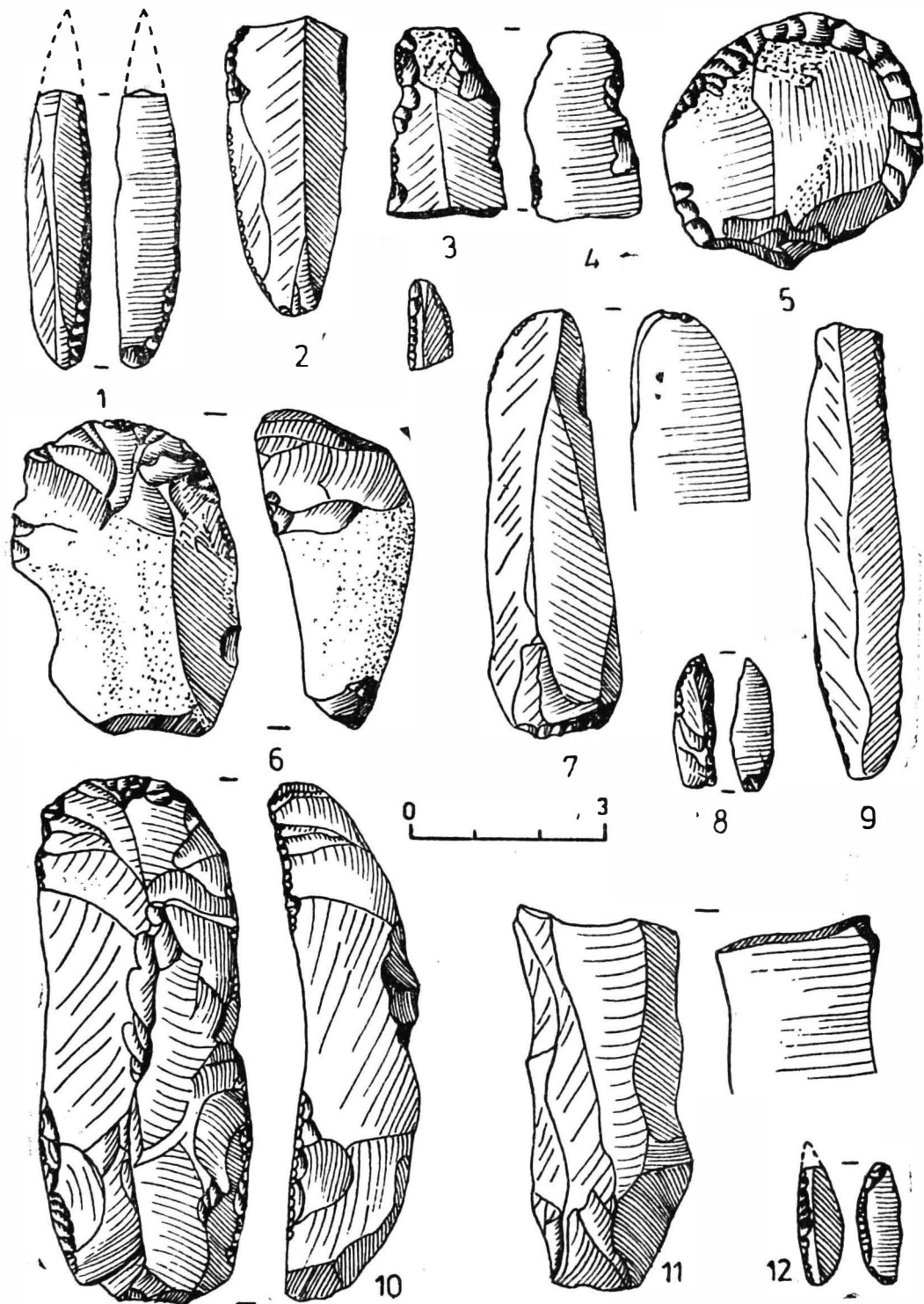


Fig. 38 — Ripiceni-Valca Badelui : 1—12, level I (after Al. Păunescu).

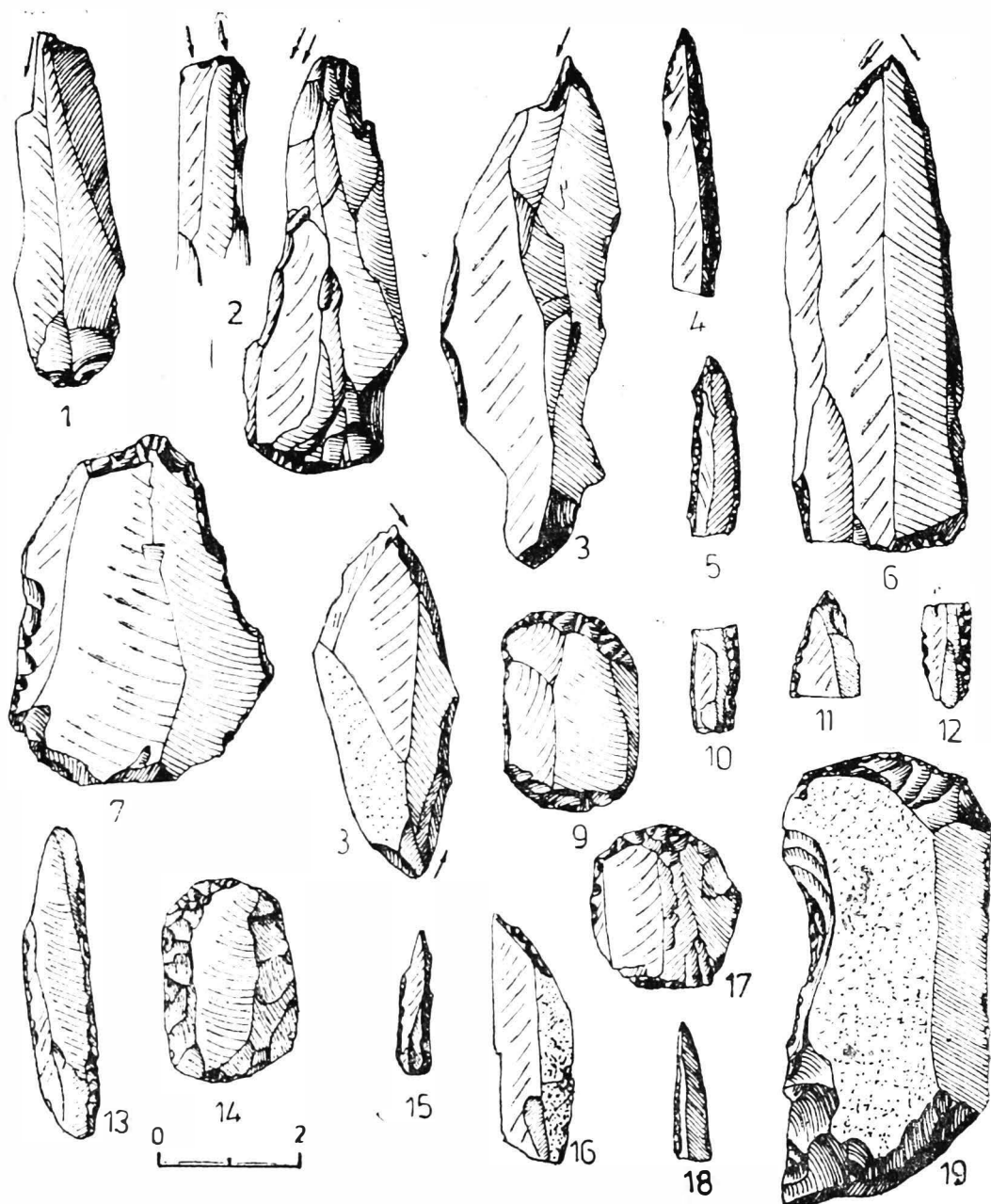


Fig. 39 — Ștefănești-Podul peste Bașeu (the bridge across the Bașeu Creek) (1, 4); Dorohoi-Strachina III (5, 6, 10, 12); Dorohoi-Cimitir (7); Dorohoi-Strachina I (8, 9, 11); Dorohoi-Strachina II (1—3, 6, 8) (after Al. Păunescu, Gh. M. Vasiliu).

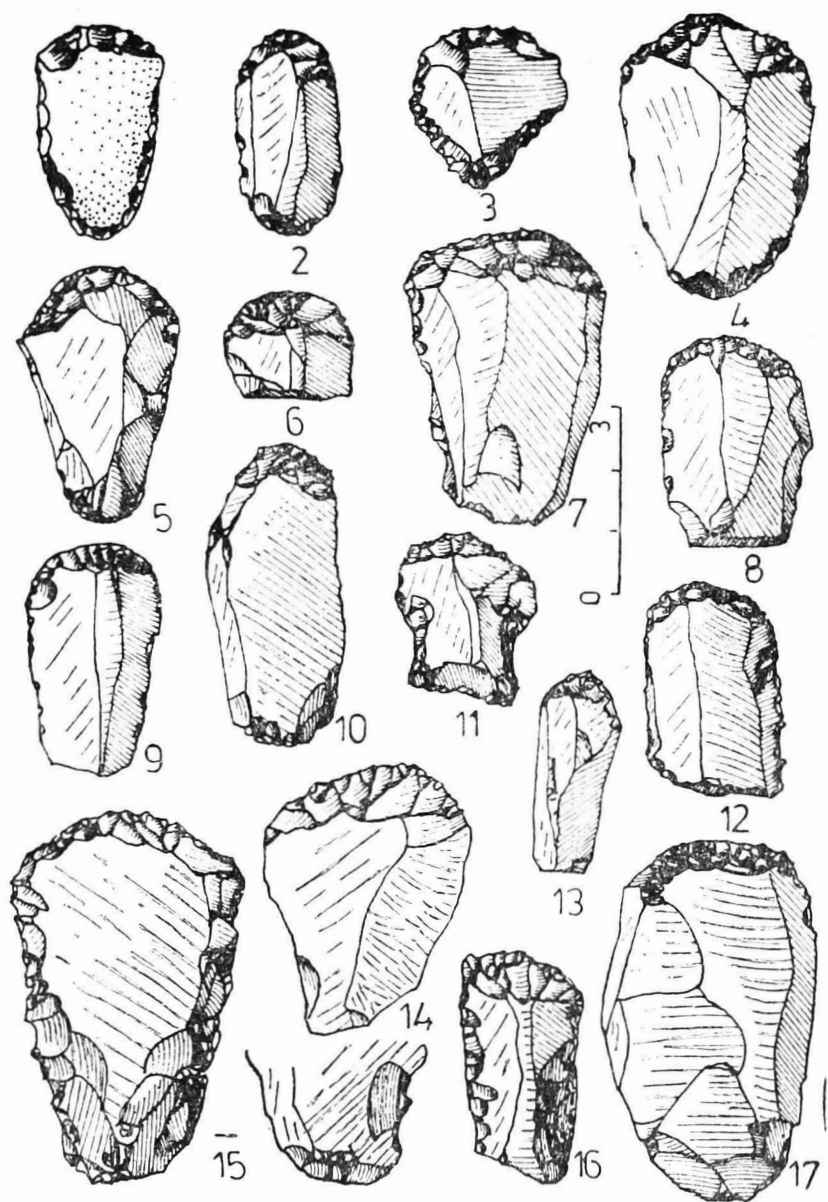


Fig. 40 — Udești-Poiana (after M. Bîțiri).

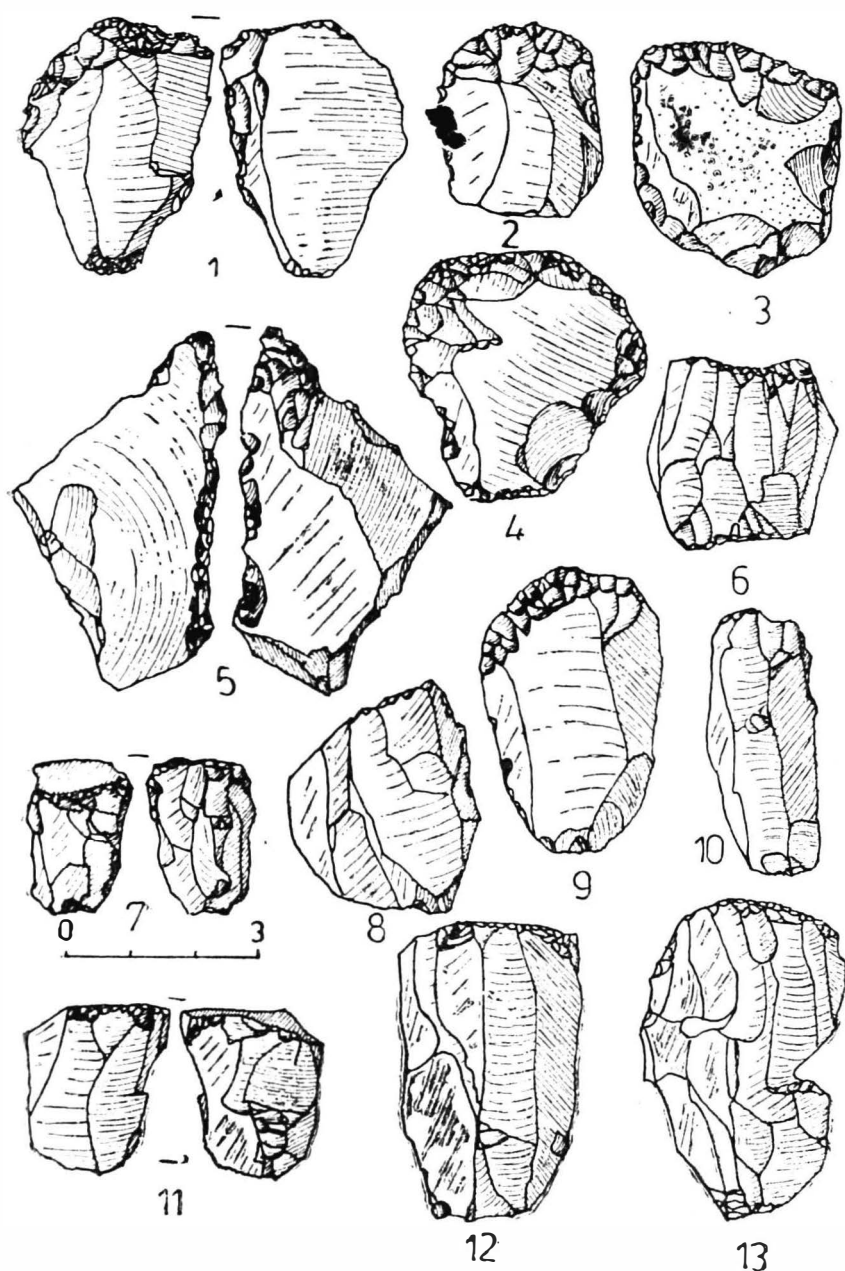


Fig. 41 — Udești-Poiana (after M. Biliri).

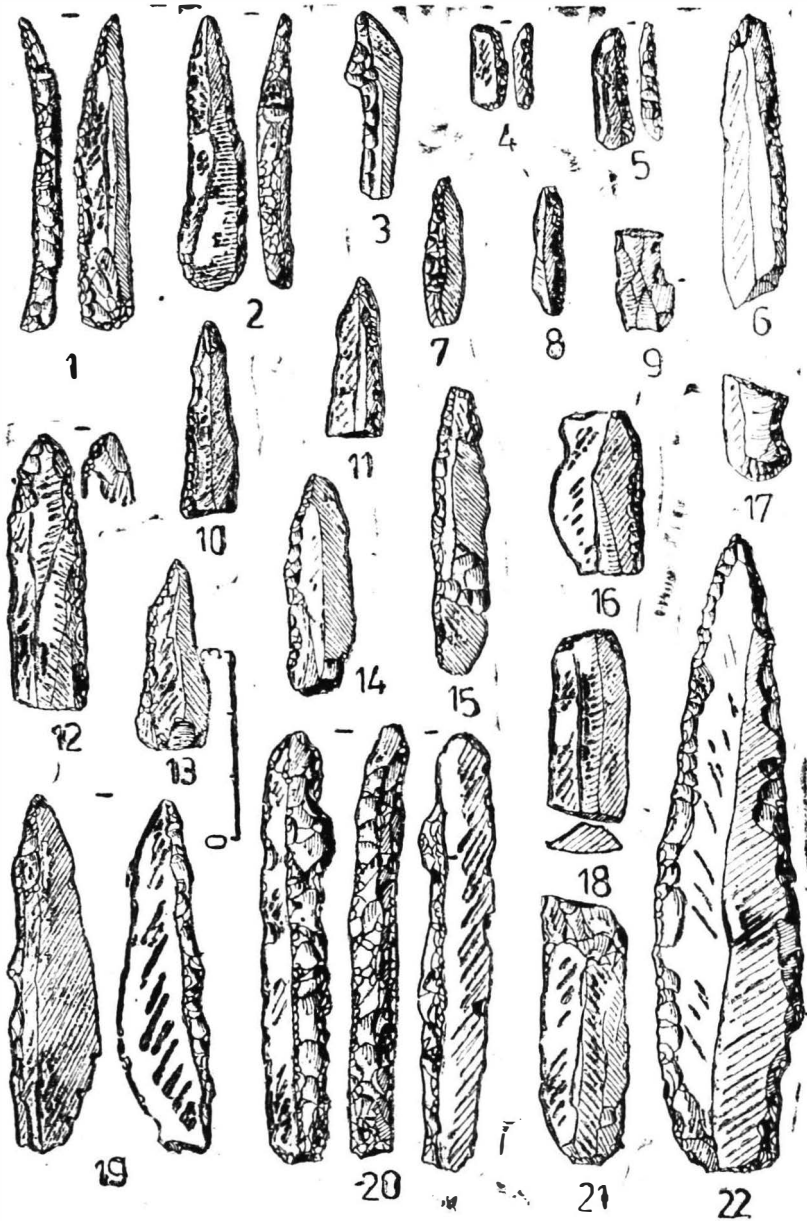


Fig. 42 — Udești-Poiana (after M. Bitiri).

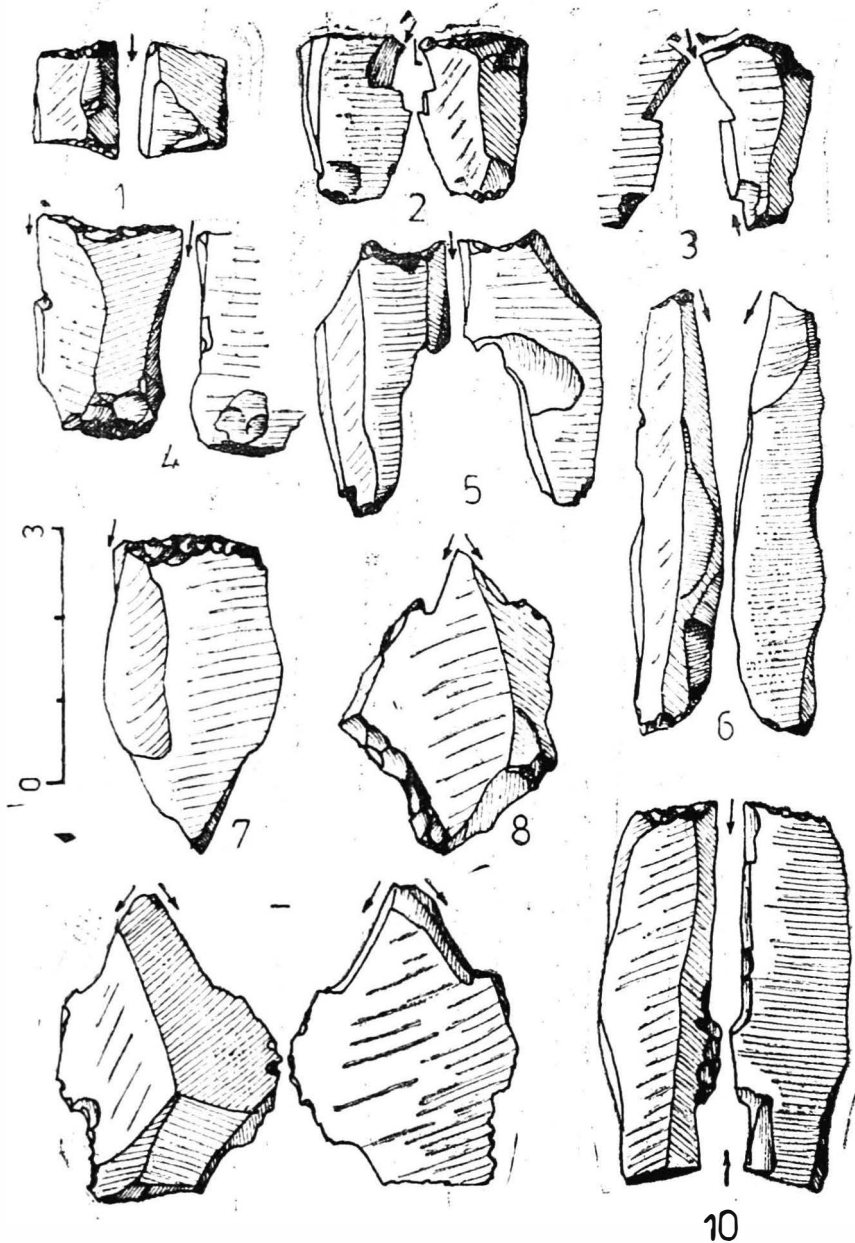


Fig. 43 — Udești-Poiana (after M. Bitiri).

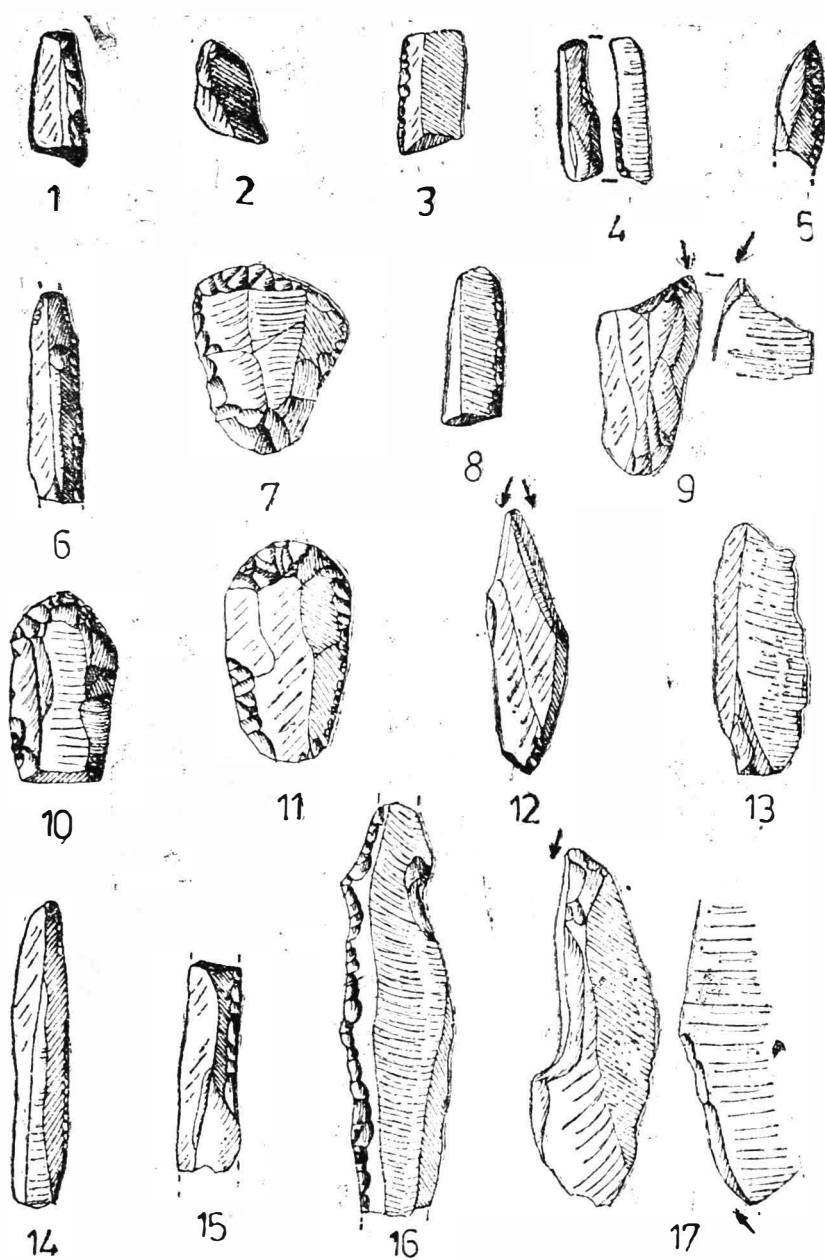


Fig. 44 — Topile-Dealul Stoicii (1—4, 6, 8, 10, 11, 15, 17); Topile-Dealul Catargii (5, 7, 9, 13, 14); Conțești (12, 16). 5/6 of full size (after Al. Păunescu).

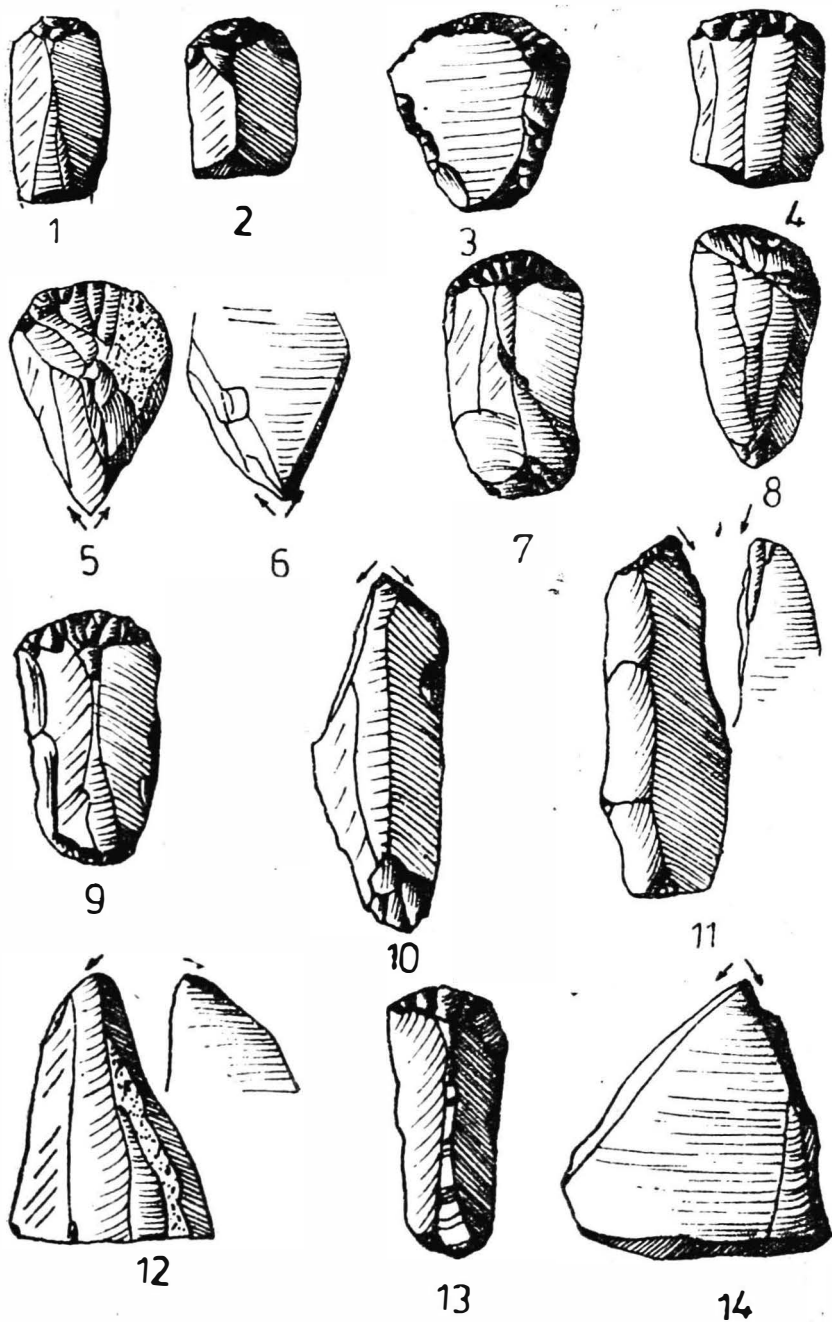


Fig. 45 — Topile-Dealul Catargii. 1/5 of full size (after Al. Păunescu).

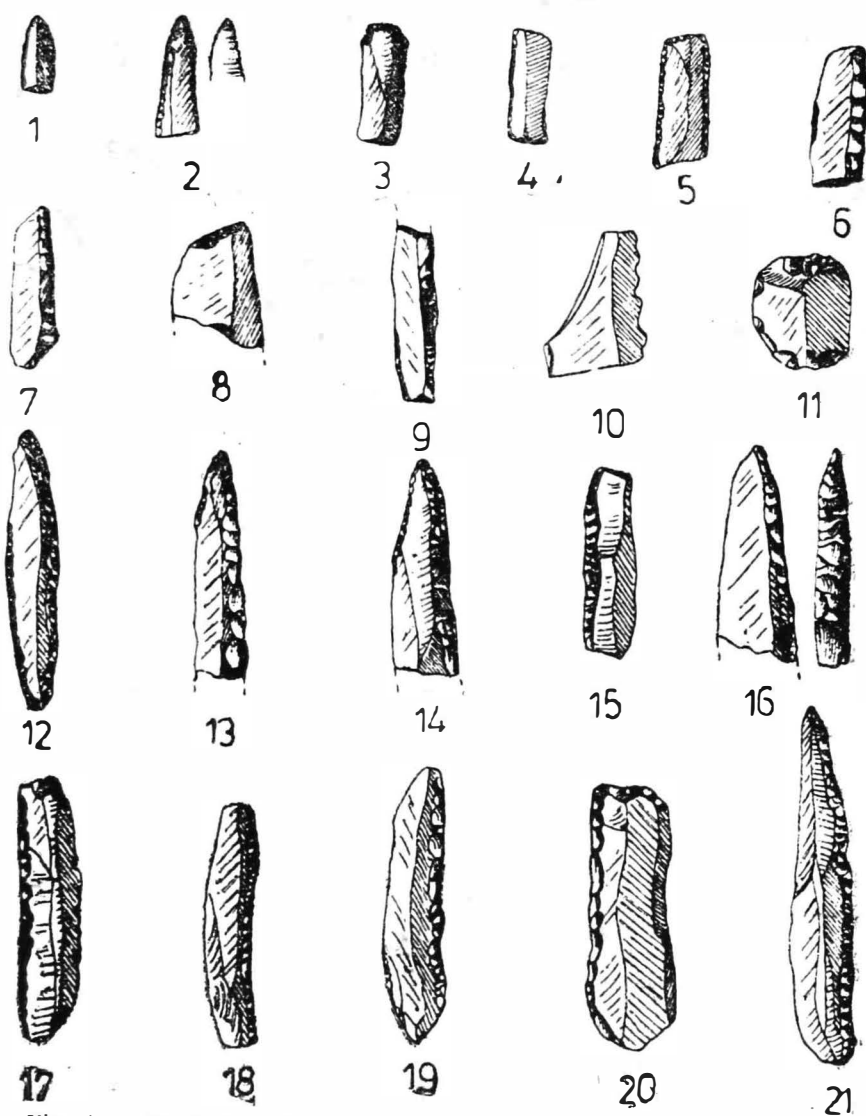


Fig. 46 — Topile-Dealul Catargii. 4/5 of full size (after Al. Păunescu).

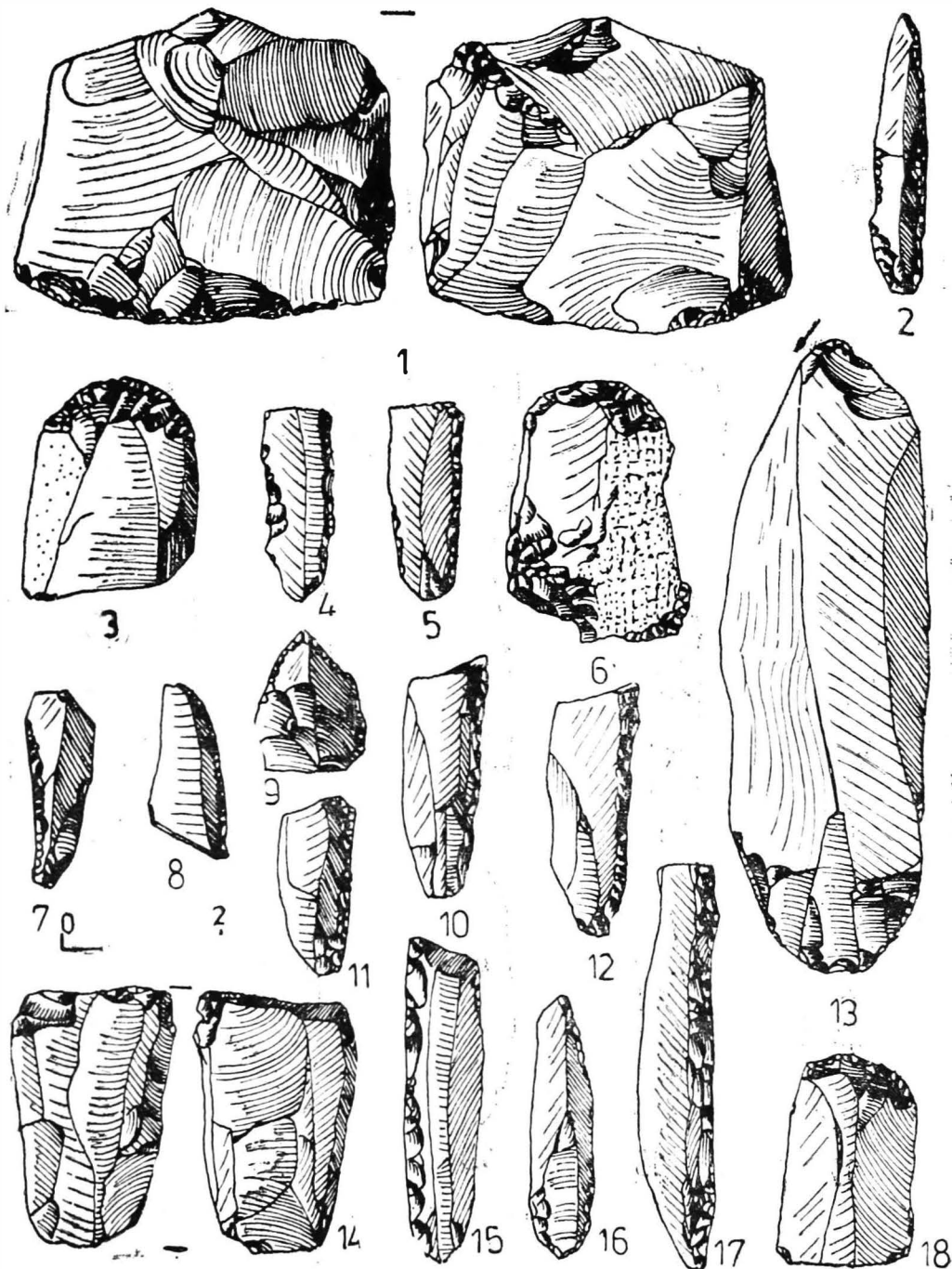


Fig. 47 — Movileni-În Răzășic (after Al. Păunescu).

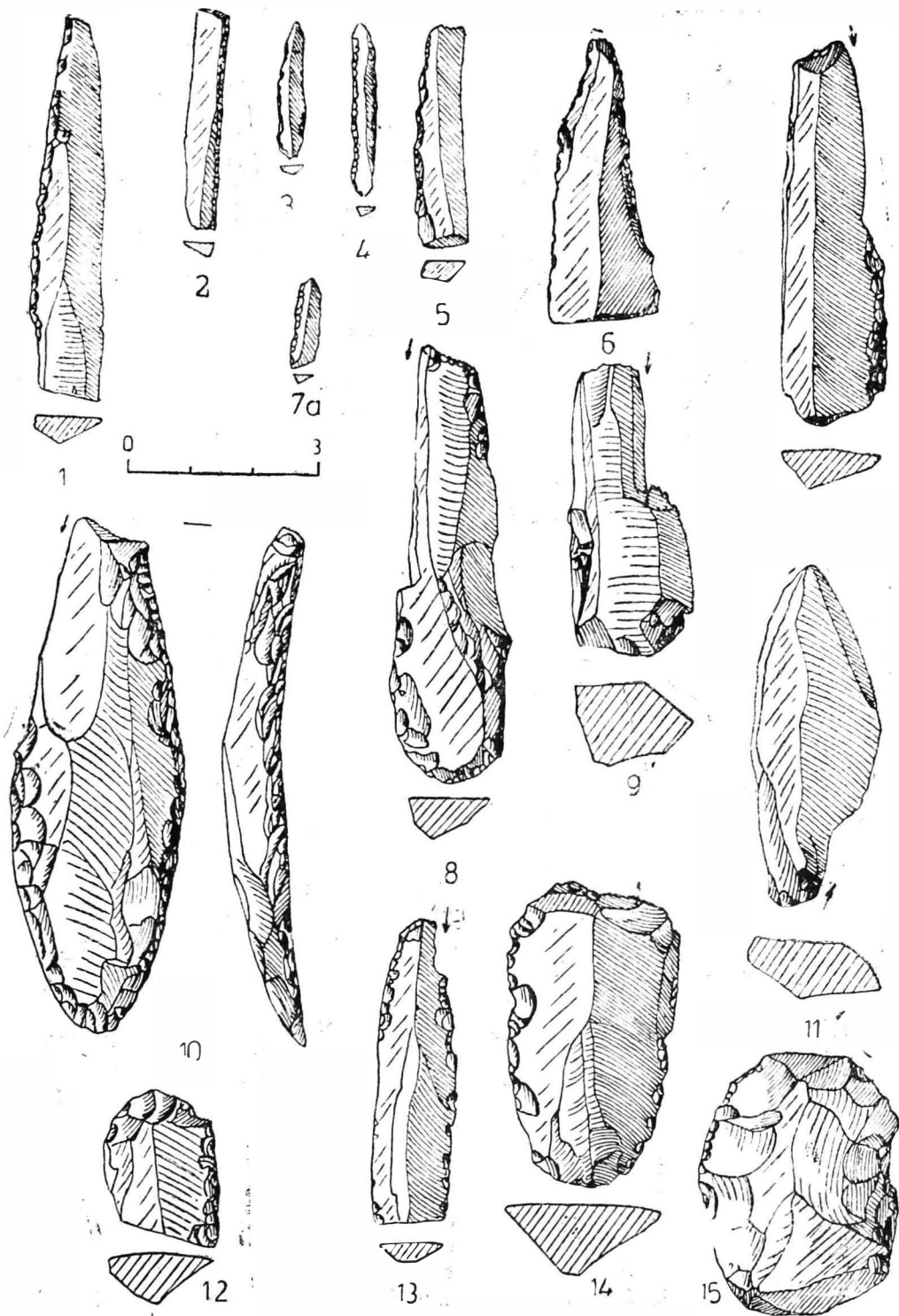


Fig. 48 — Buda-Dealul Viei (after C.S. Nicolăescu-Plopșor et al.).

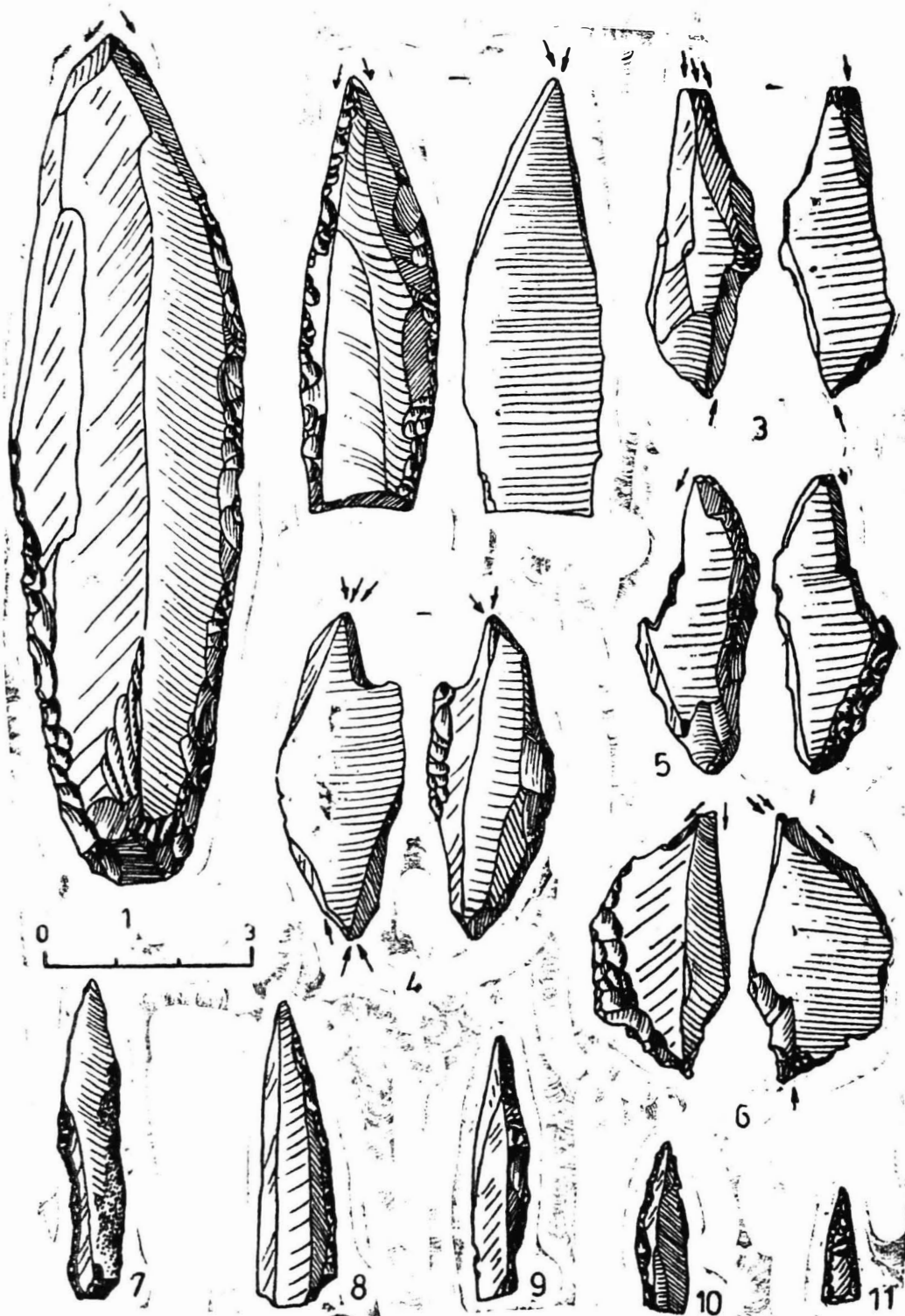


Fig. 49 — Buda-Dealul Viei (after V. Căpitanu, C. Buzdugan, V. Ursachi).

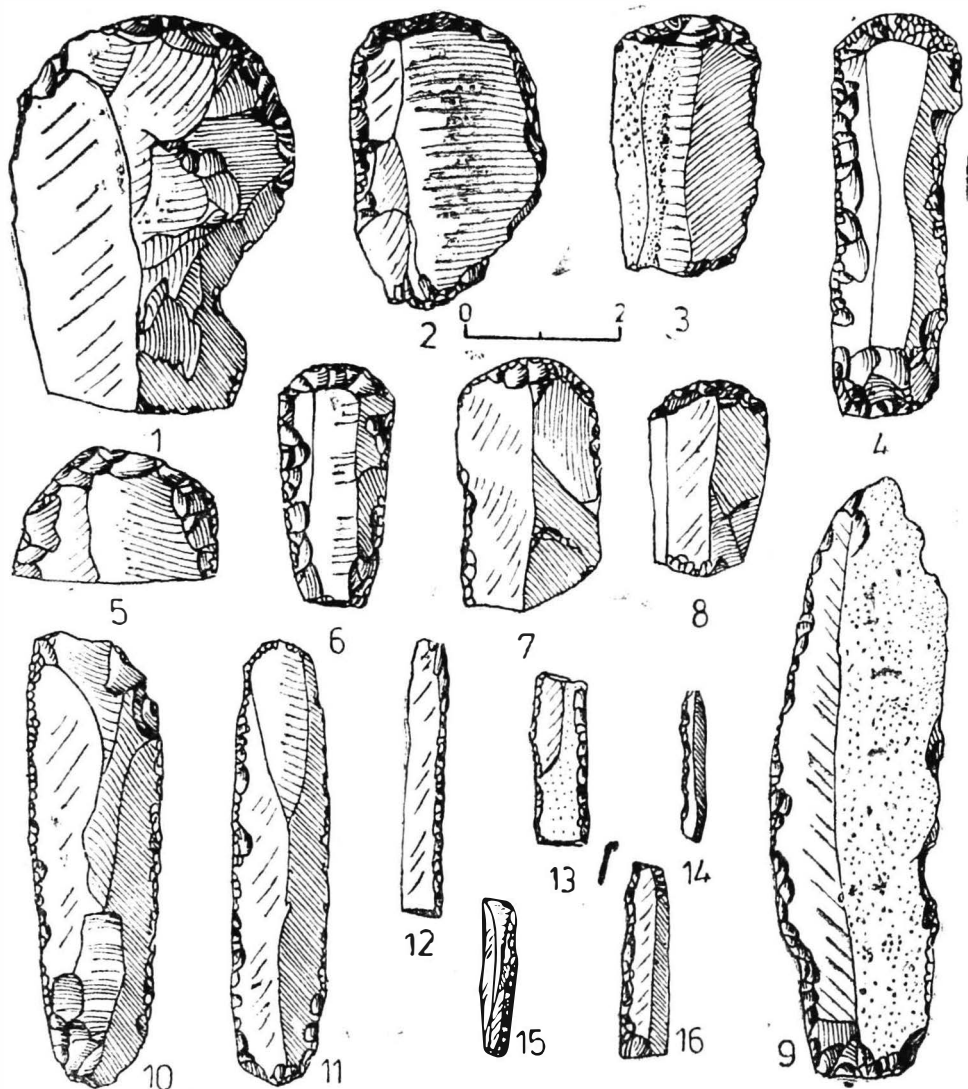


Fig. 50 — Buda-Dealul Viei (after V. Căpitanu, C. Buzdugan, V. Ursachi).

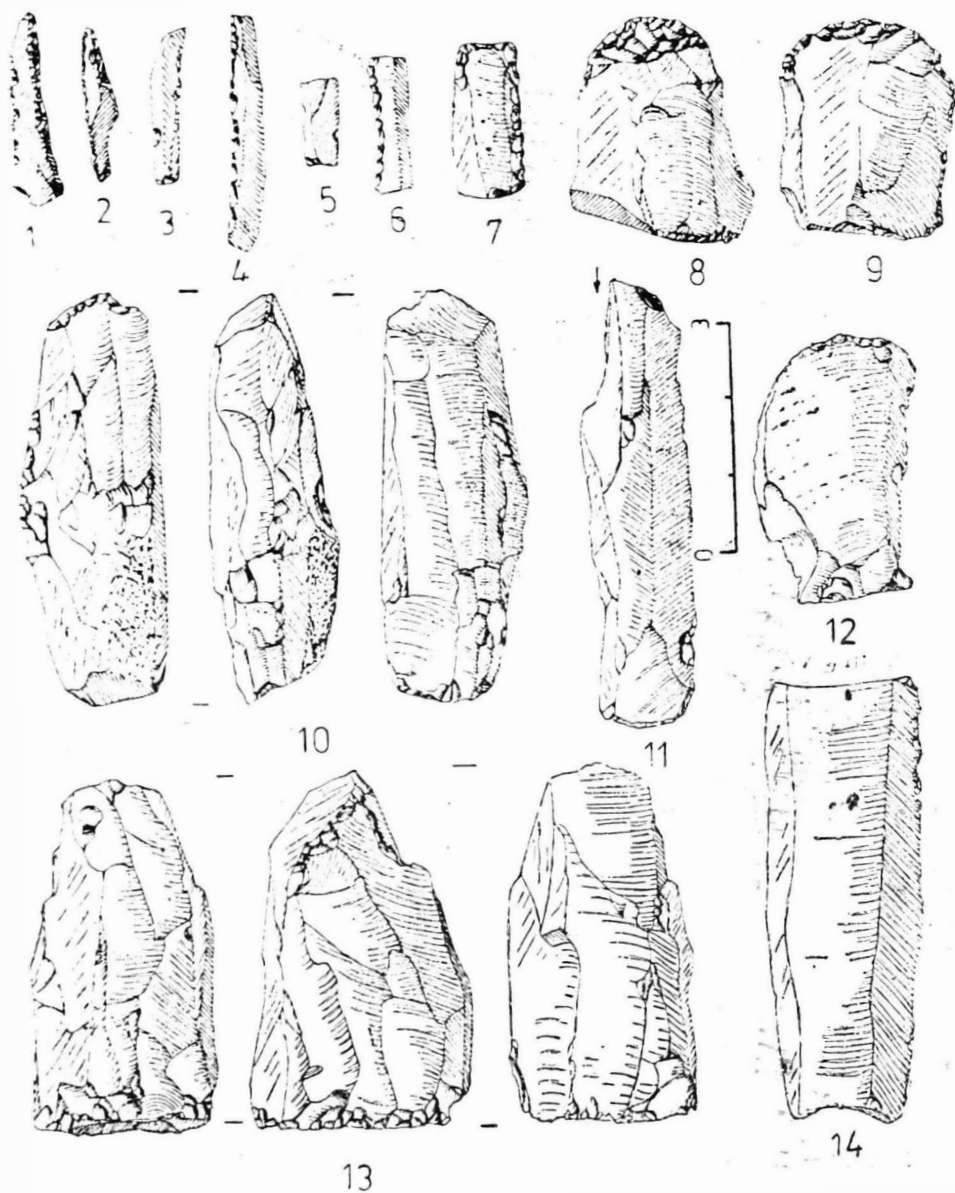


Fig. 51 — Lespezi-Lutărie (after M. Bitiri).

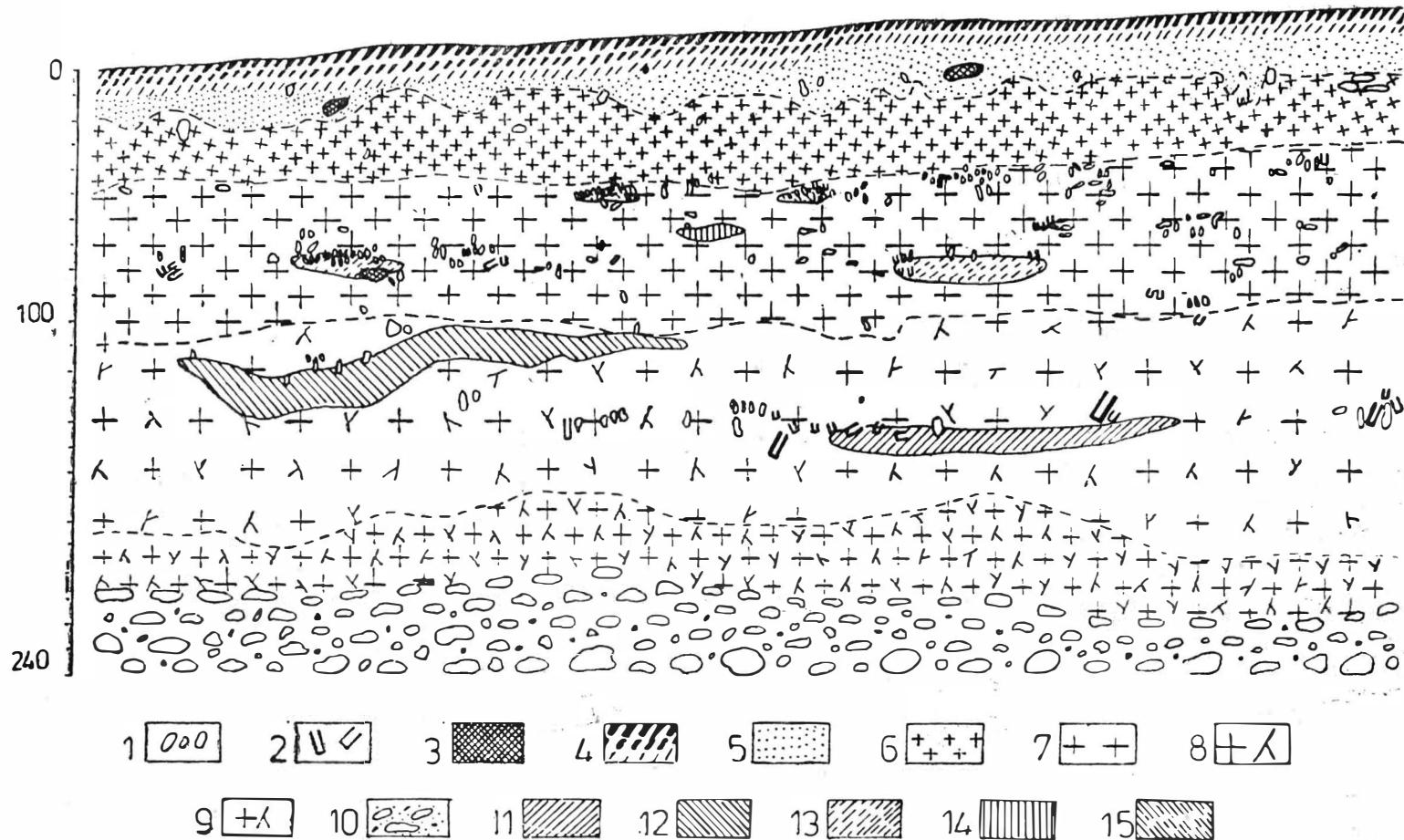


Fig. 52 — Bistricioara-Lutărie II. Schematic Stratigraphy: 1, lithic objects; 2, bones; 3, gritstones and sands; 4, dark-coloured vegetal humic soil-chernozem; 5, yellowish loess; 6, reddish-red loess; 7, yellowish-red loess; 8, reddish-grey soil; 9, „pseudo-micelian“ grey soil; 10, terrace gravel; 11, hearths; 12, Aurignacian layer; 14–15, Gravettian layers (after C. S. Nicolăescu-Plopșor et al.).

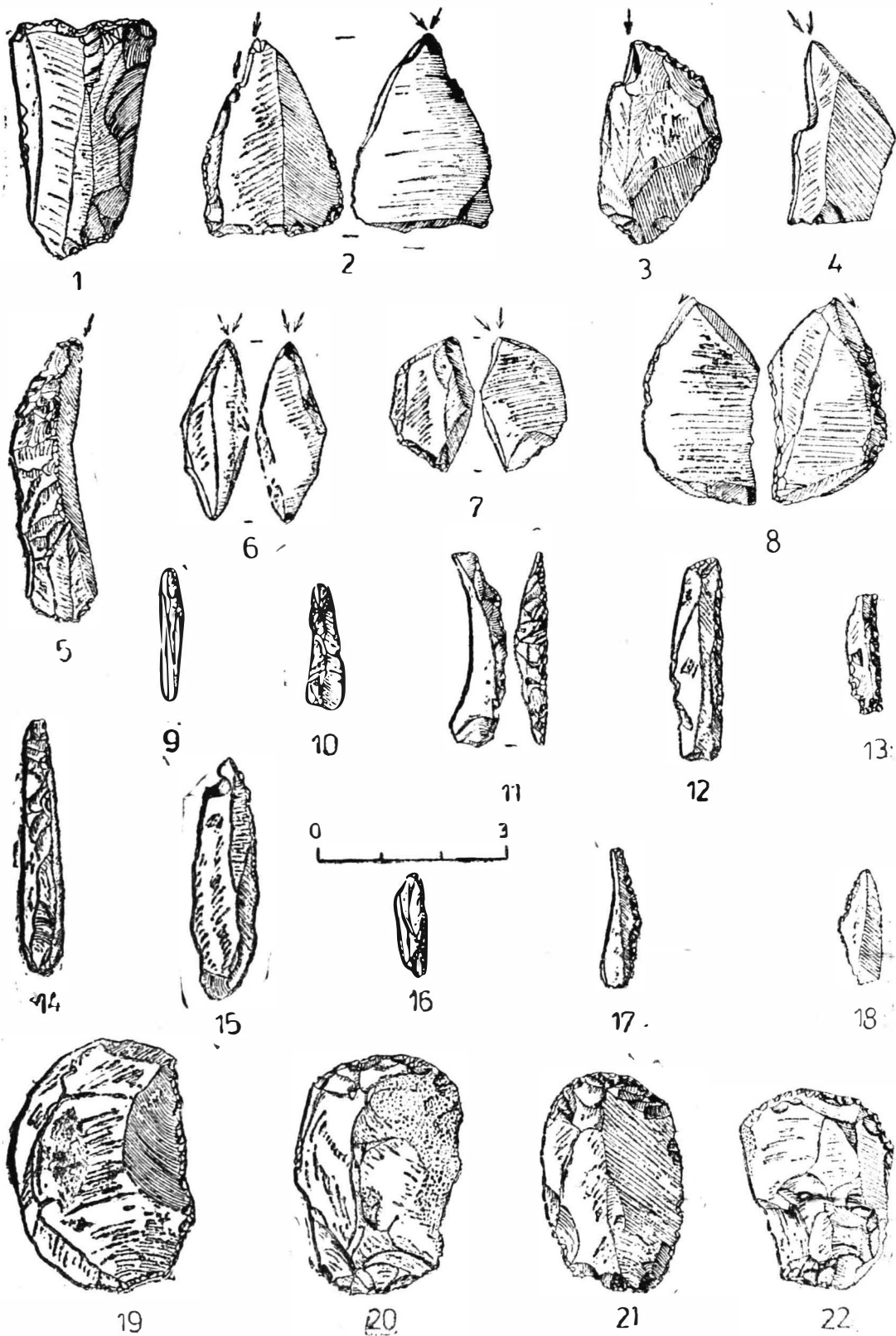


Fig. 53 — Bistricioara-Lutărie, level III (after C. S. Nicolăescu-Plopșor et al.).

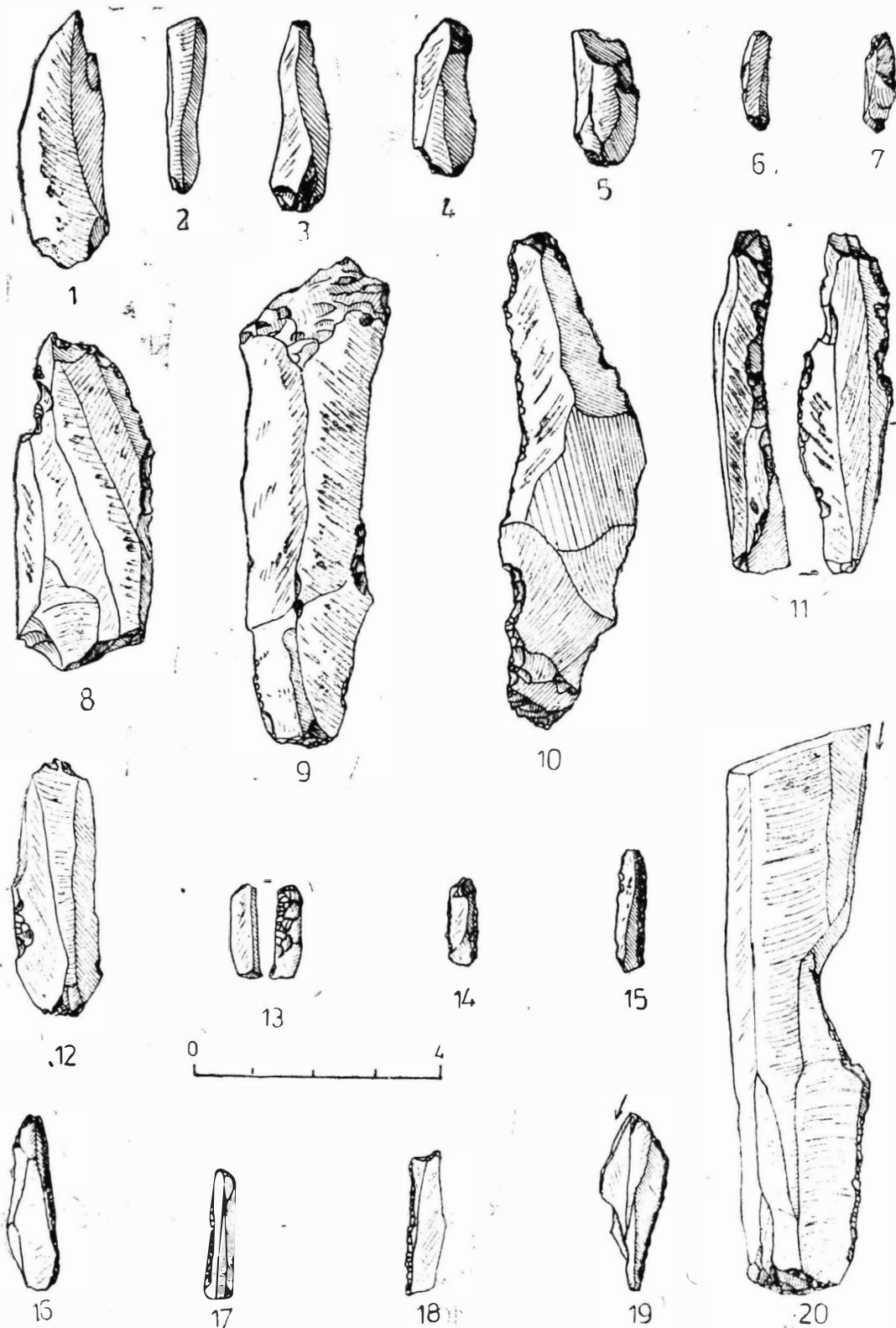


Fig. 51 — Bistrițioara-Lutârie, level IV (after G. S. Niculescu-Plopșor et al.).

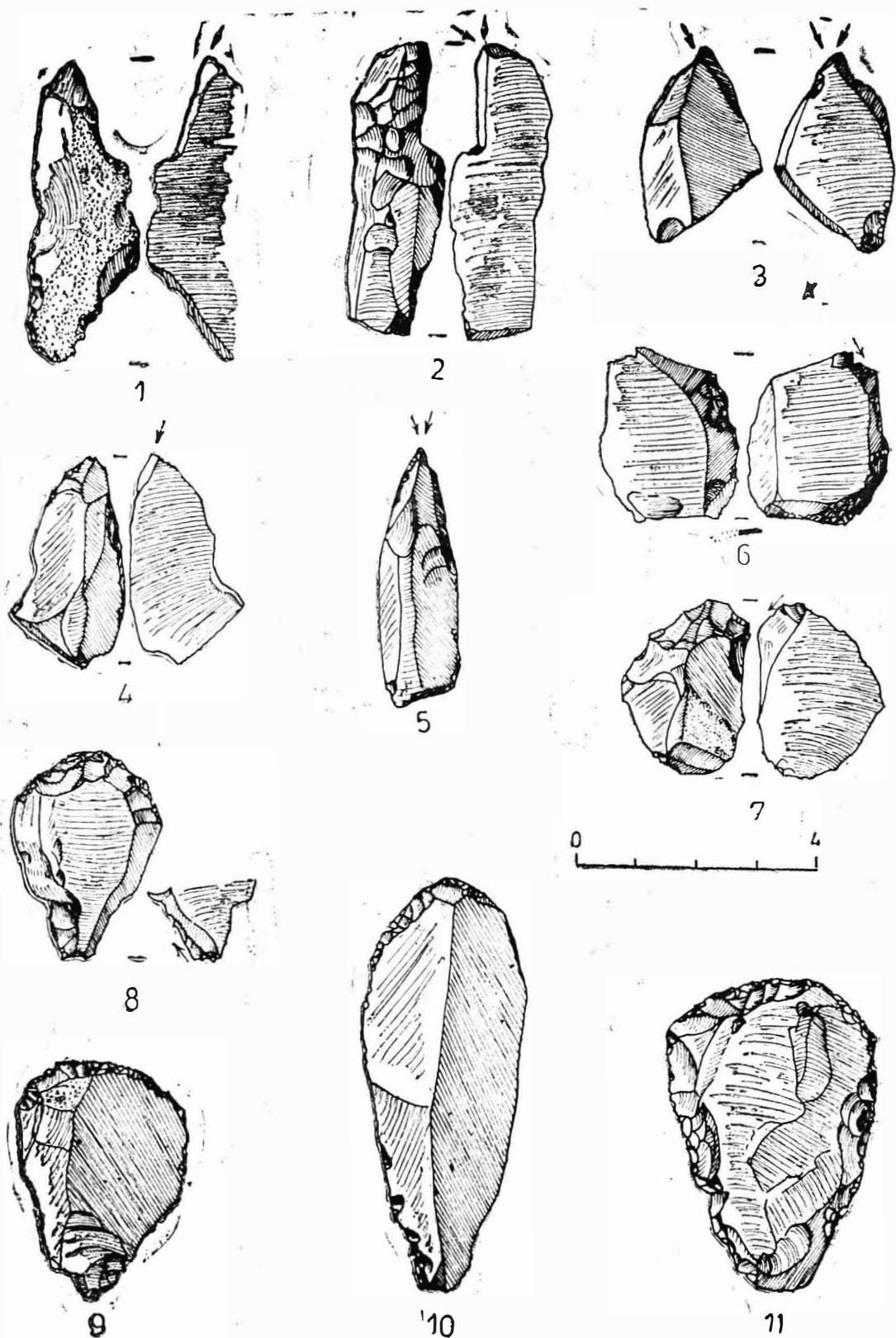


Fig. 55 — Bistricioara-Lutărie, level IV (after C.S. Nicolăescu-Plopșor et al.).

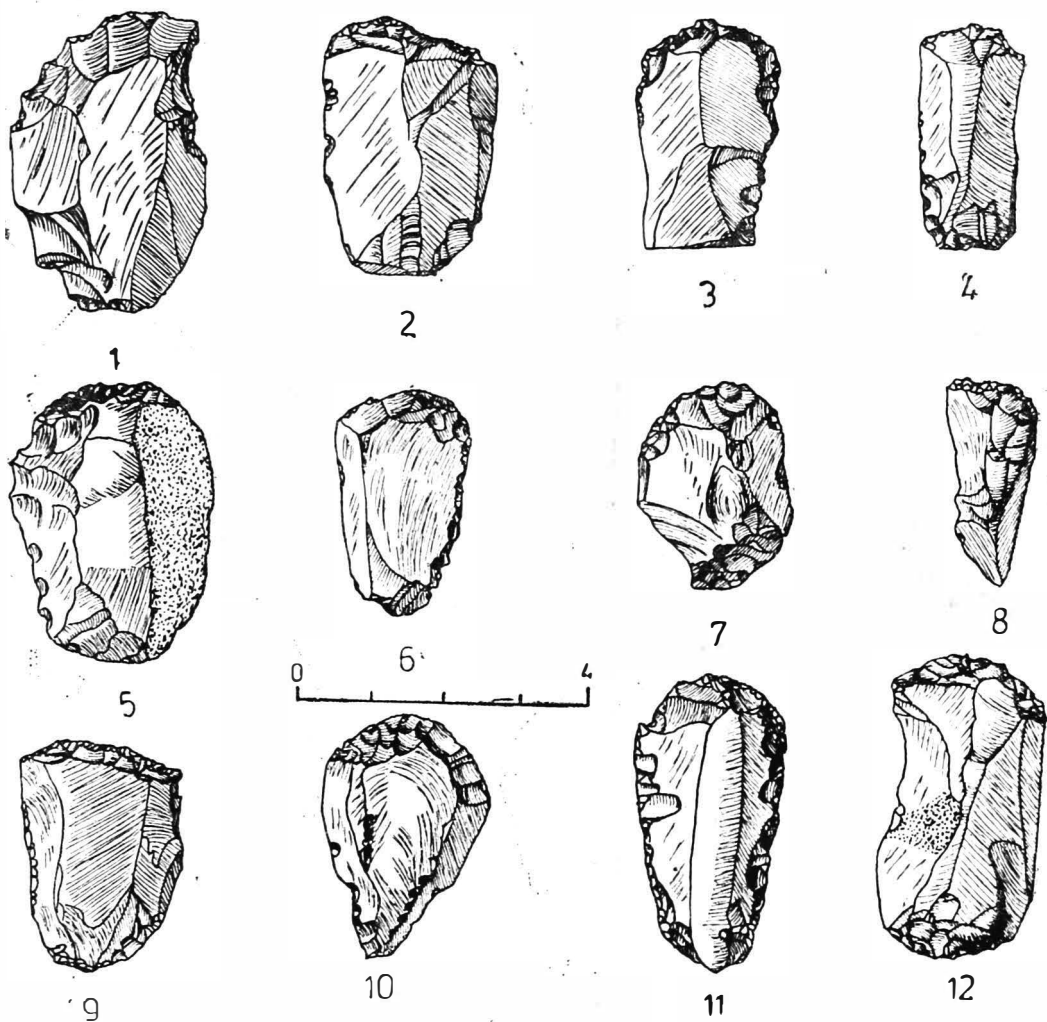


Fig. 56 — Bistricioara-Lutărie, level IV (after C. S. Nicolăescu-Plopșor et al.).

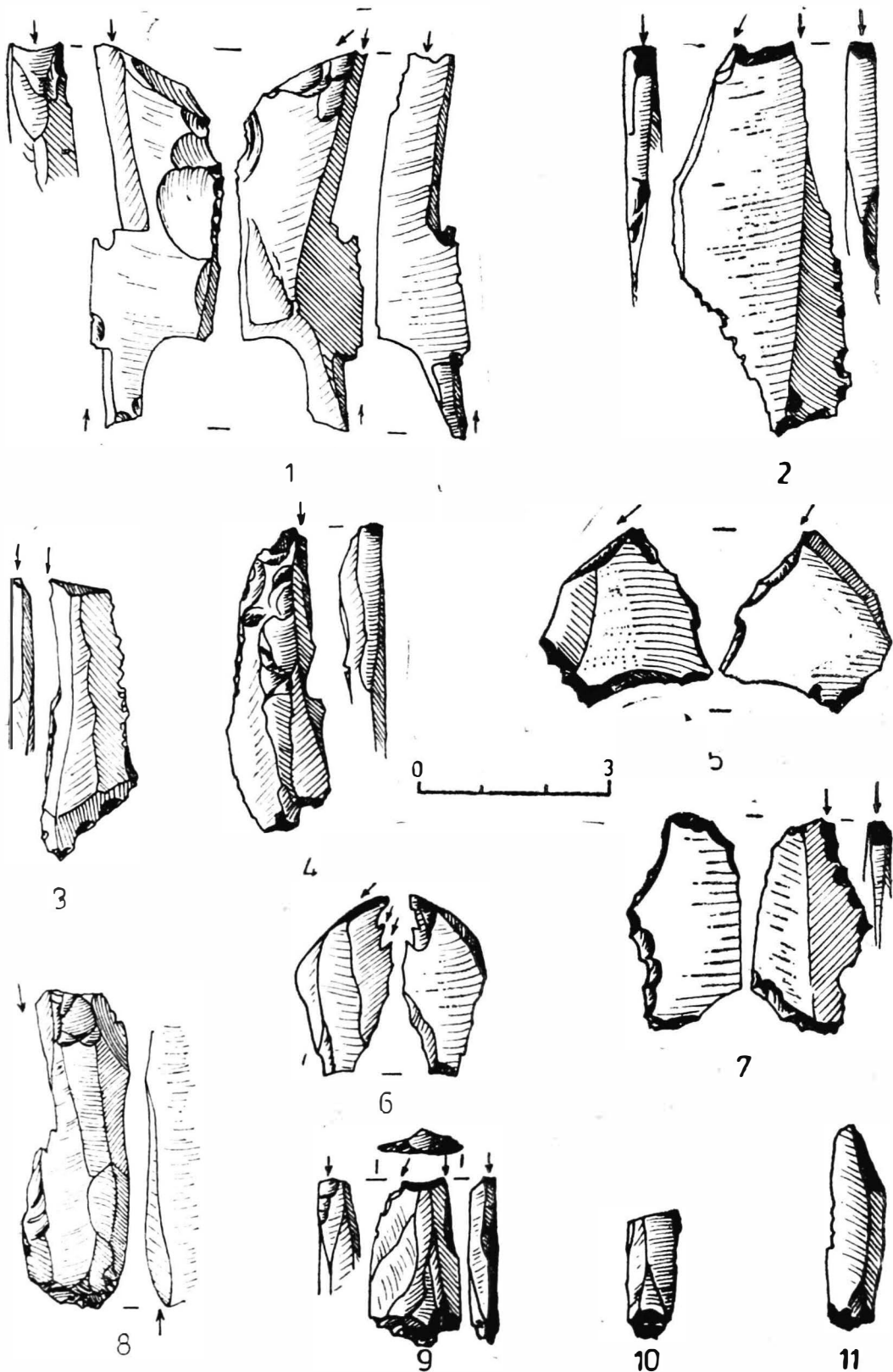


Fig. 57 — Bistricioara-Iutărie, level V (after C. S. Nicolăescu-Plopșor et al.).

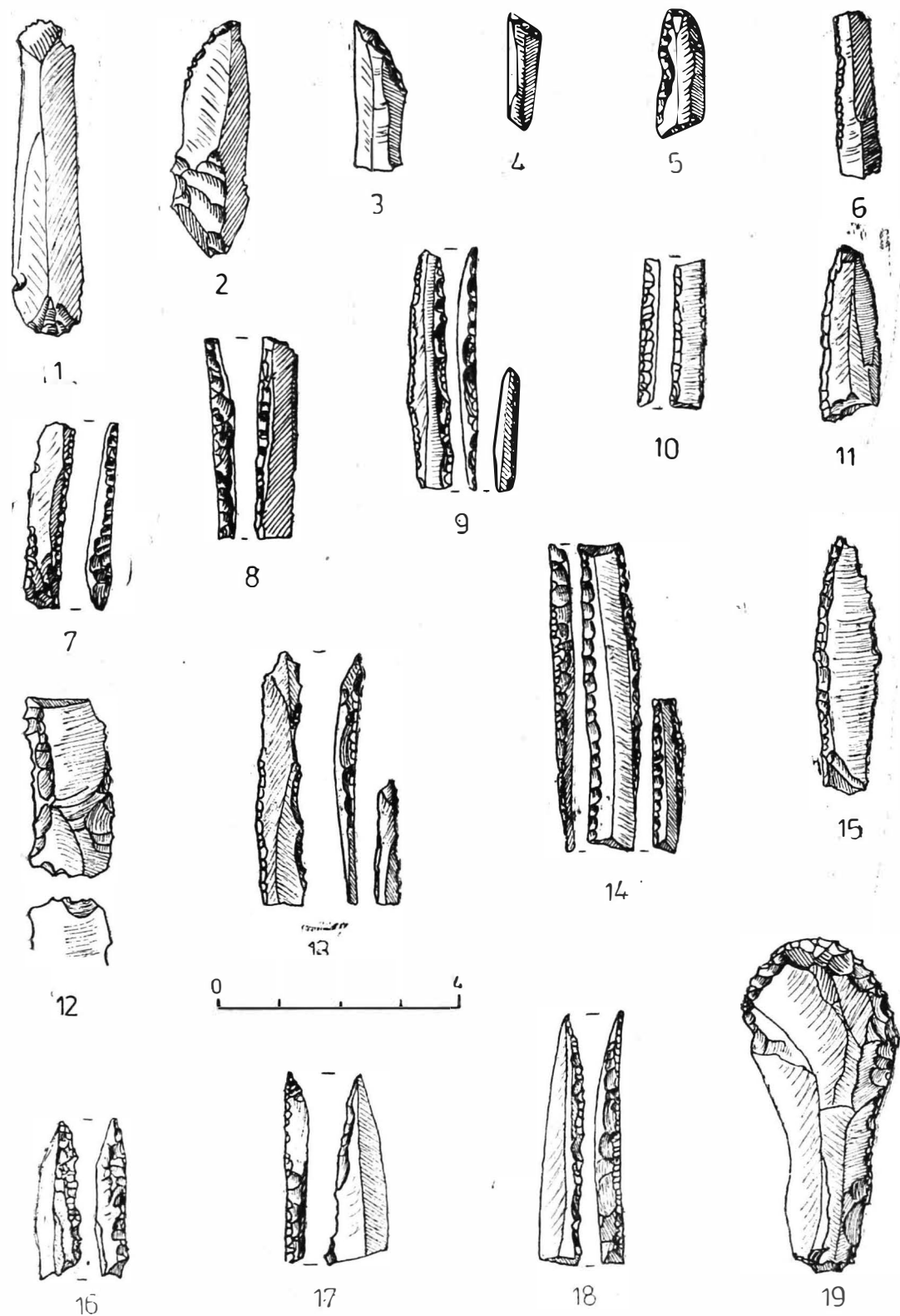


Fig. 58 — Bistricioara-Lutărie, level V (after C.S. Nicolăescu-Plopșor et al.).

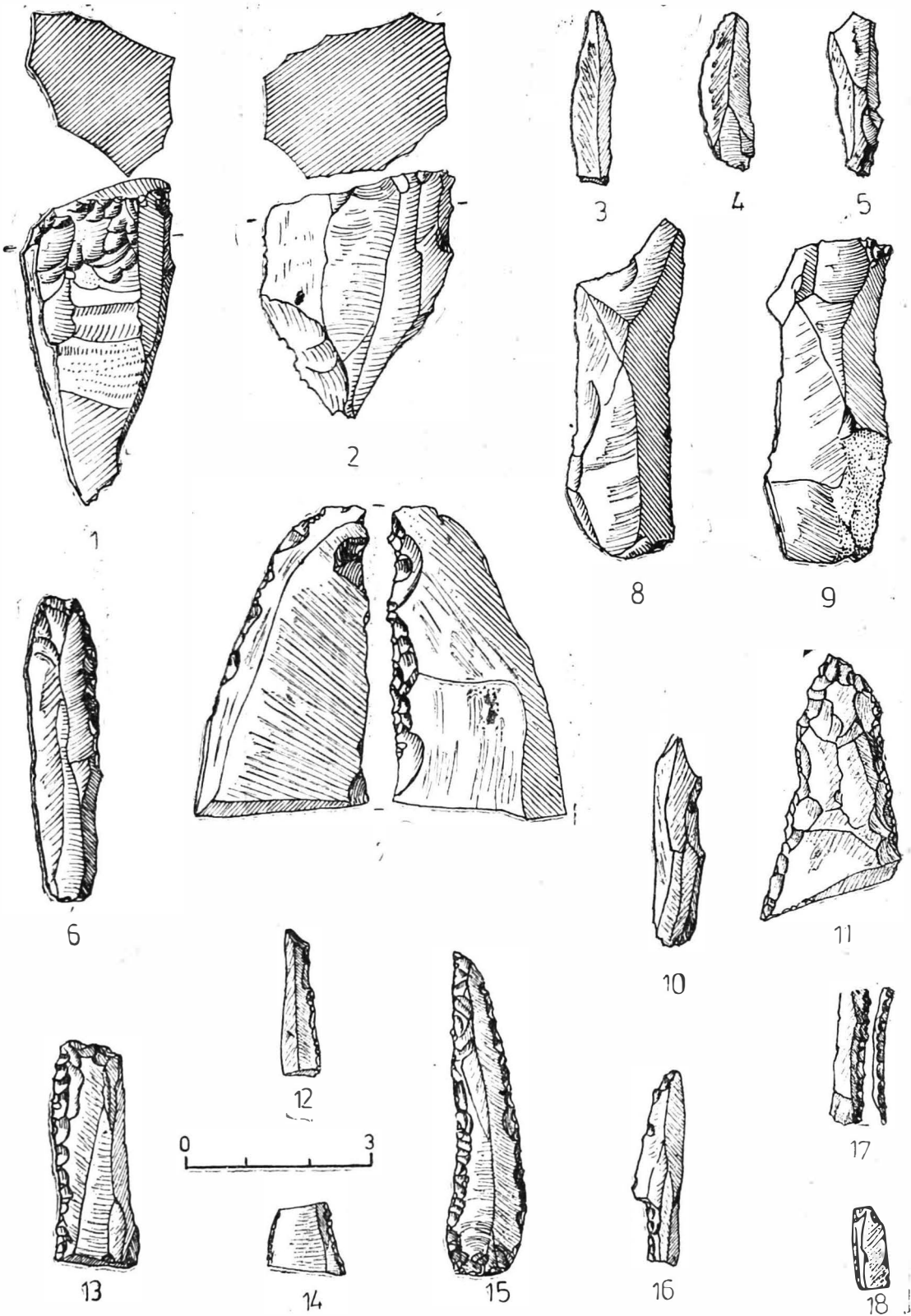


Fig. 59 — Bistricioara-Lutărie, level VI (after C. S. Nicolăescu-Plopșor et al.).

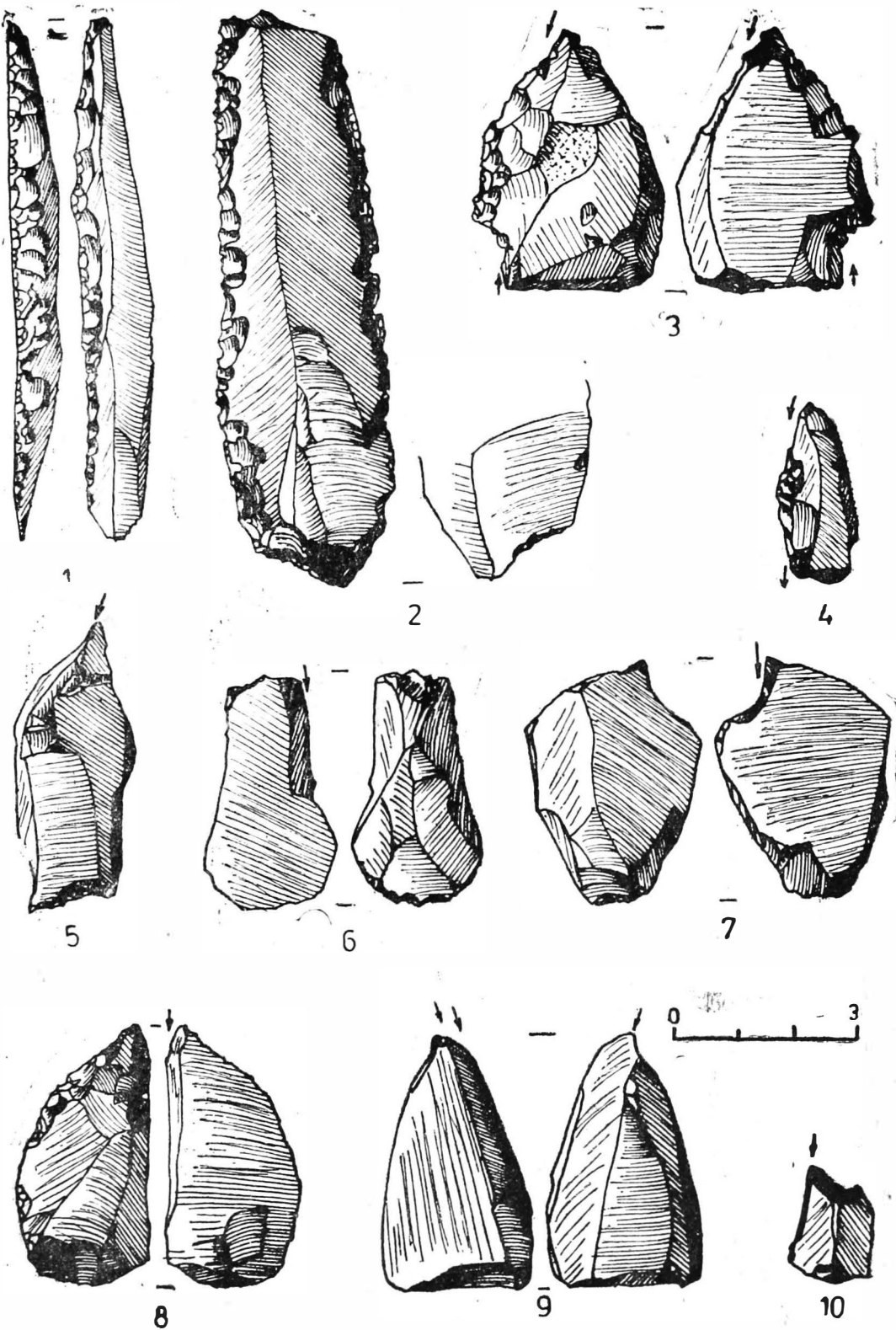


Fig. 60 — Bistricioara-Lutărie, level VI (after C. S. Nicolăescu-Plopșor et al.).

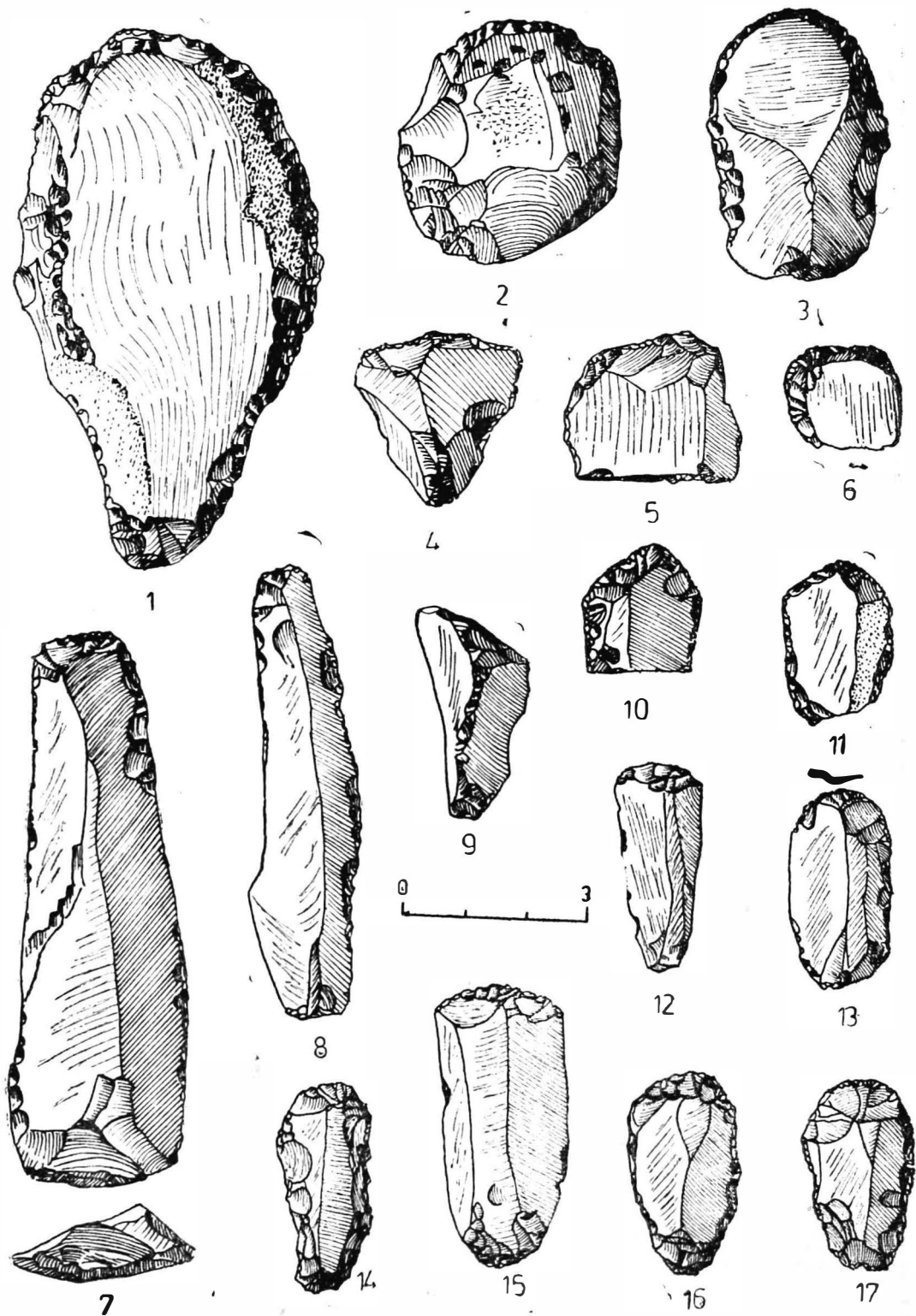


Fig. 61 — Bistricioara-Lutărie, level VI (after C. S. Nicolăescu-Plopșor et al.).

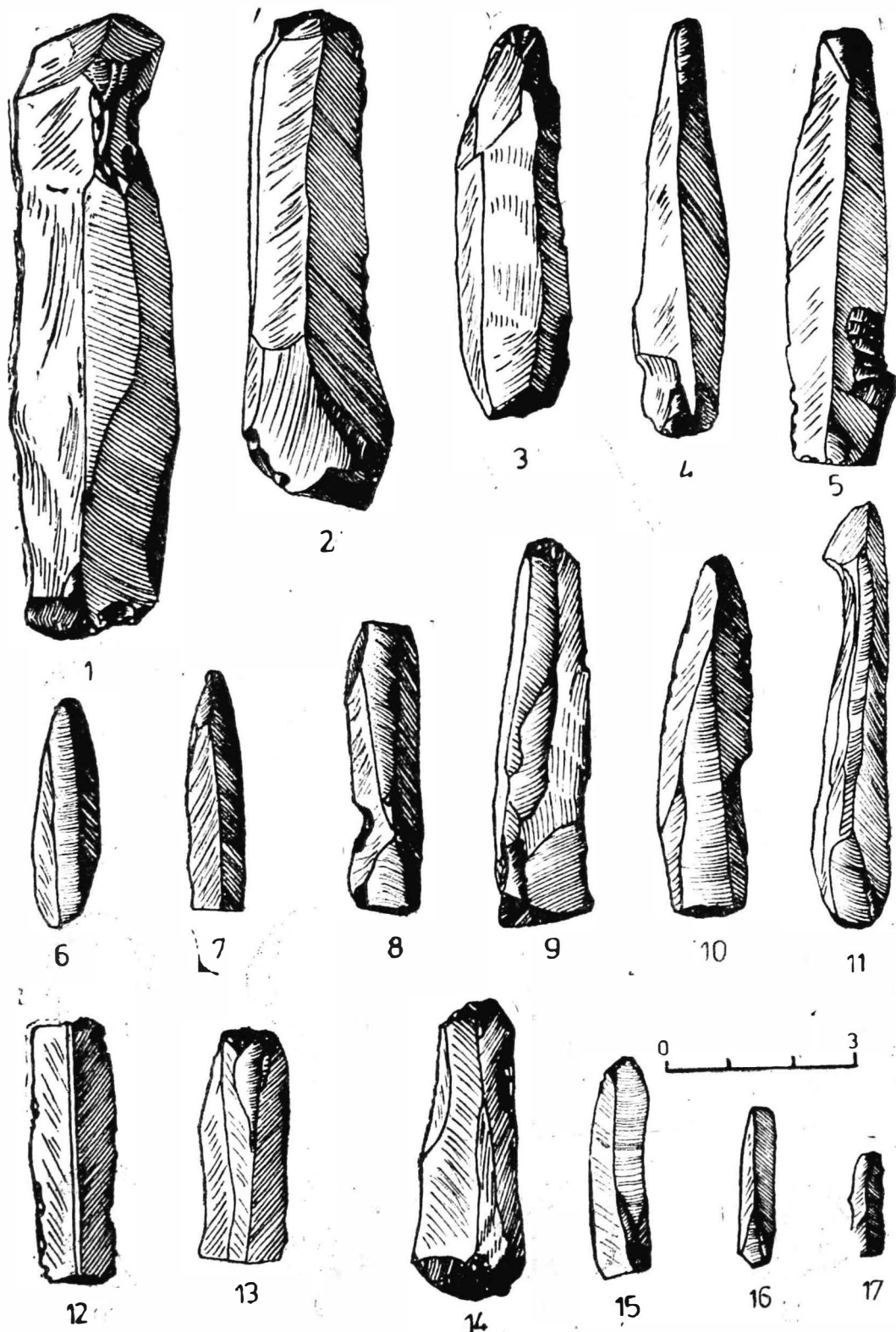


Fig. 62 — Ceahlău-Bofu Mic, level II (after C.S. Nicolăescu-Plopșor et al.).

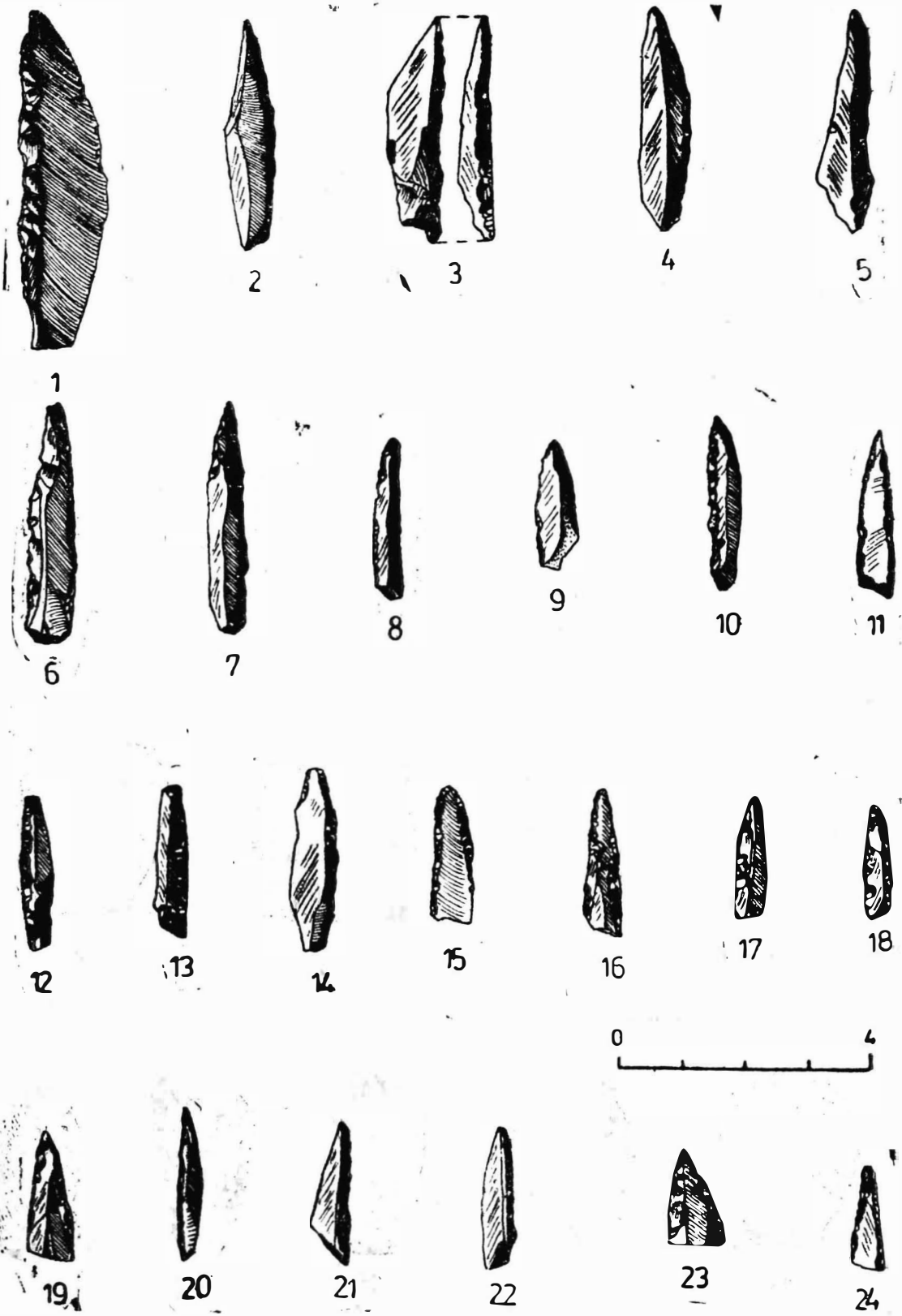


Fig. 65 — Ceahlău-Bôfu Mic. level II (after C.S. Nicolăescu-Plopșor et al.).

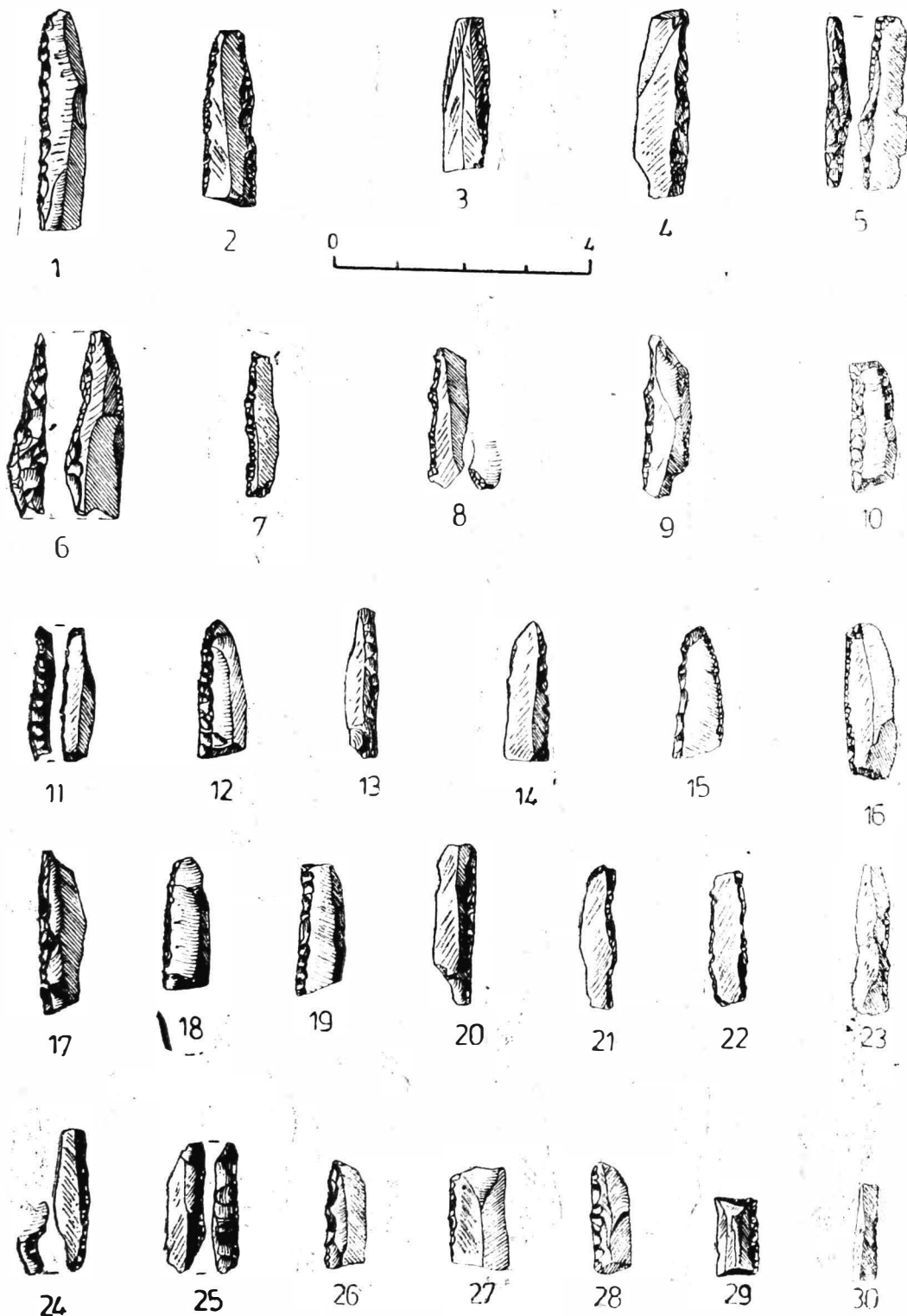


Fig. 66 — Ceahlău-Bofu Mic, level II (after C.S. Nicolăescu-Plopșor et al.).

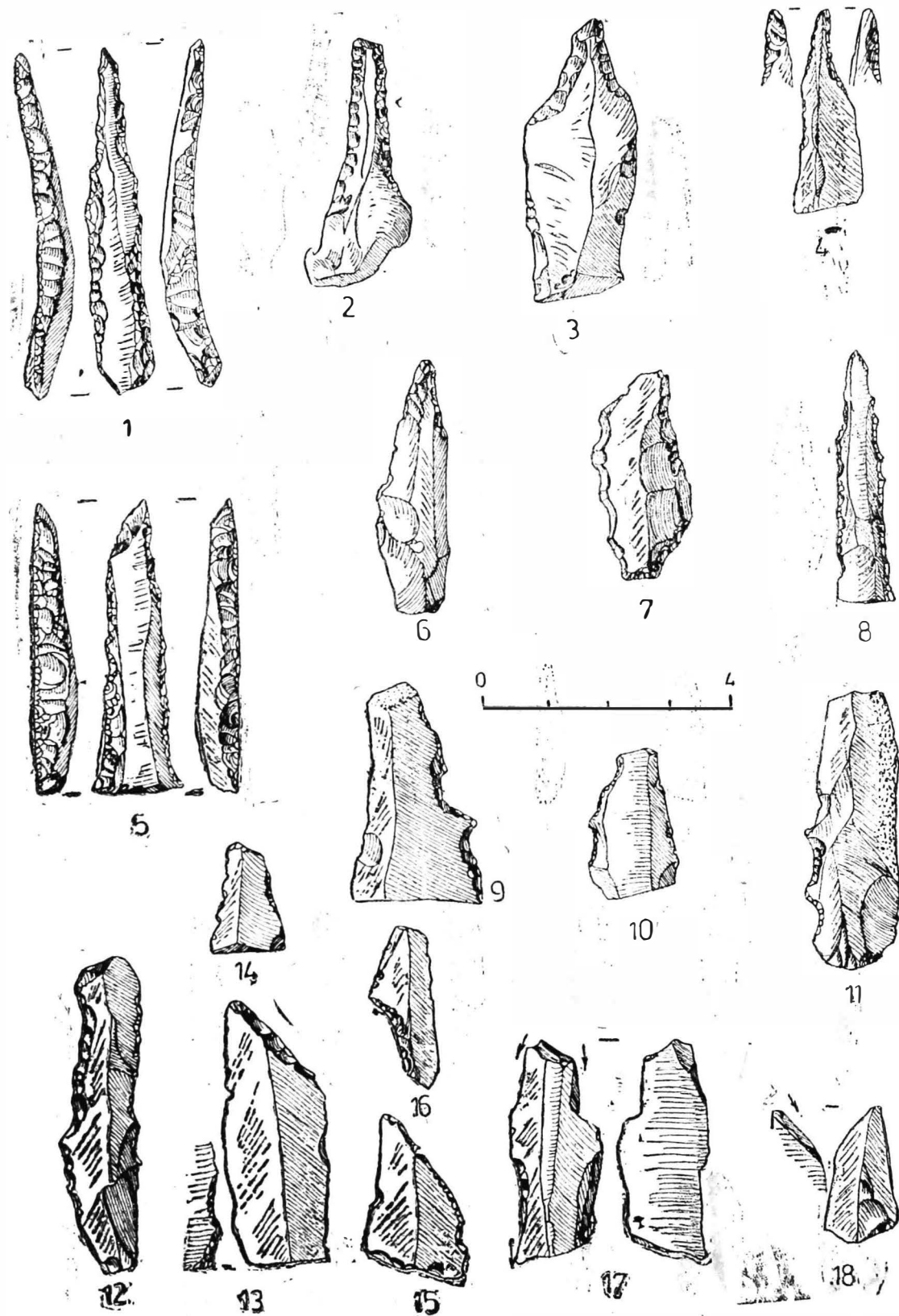


Fig. 67 — Ceahlău-Bofu Mic, level II (after C.S. Nicolăescu-Plopșor).

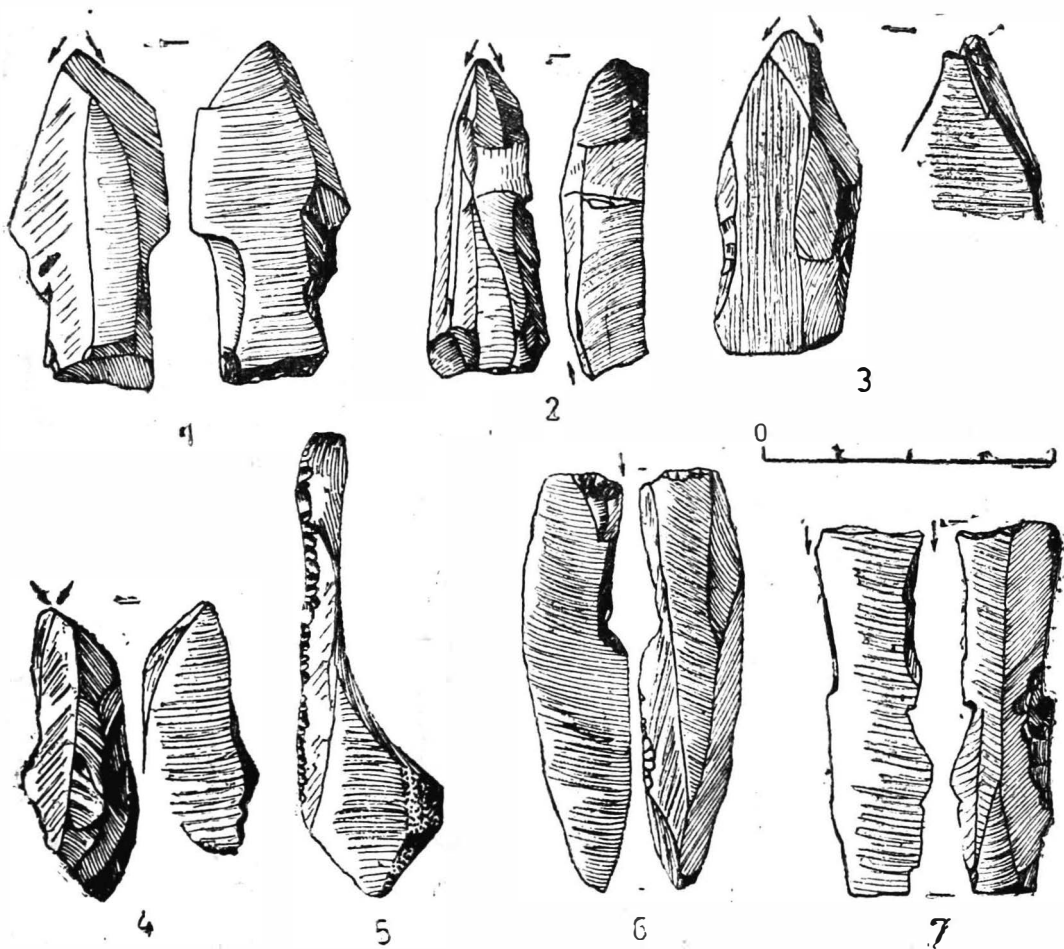


Fig. 68 — Ceahlău-Bofu Mic, level II (after C.S. Nicolăescu-Plopșor et al.).

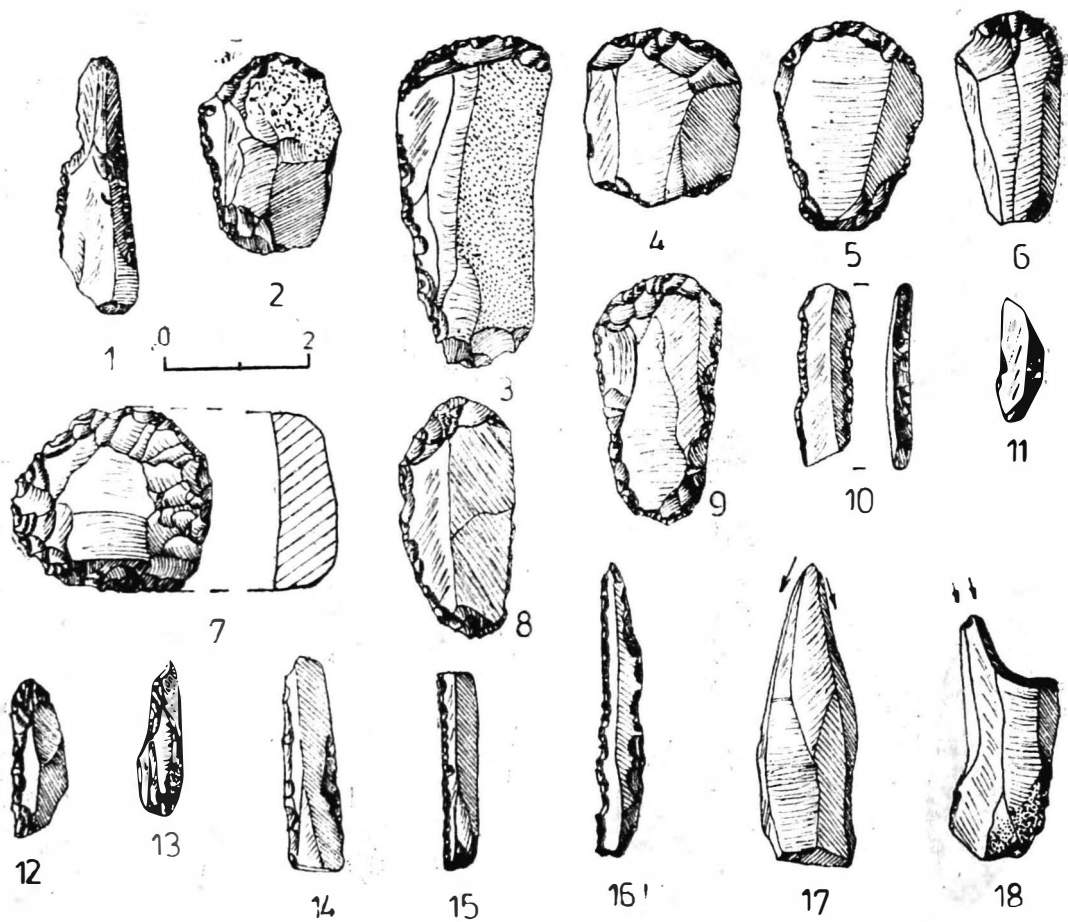


Fig. 69—Ceahlău-Dirțu. 1—2, level III; 3—18, level IV (after G.S. Nicolăescu-Plopșor et al.).

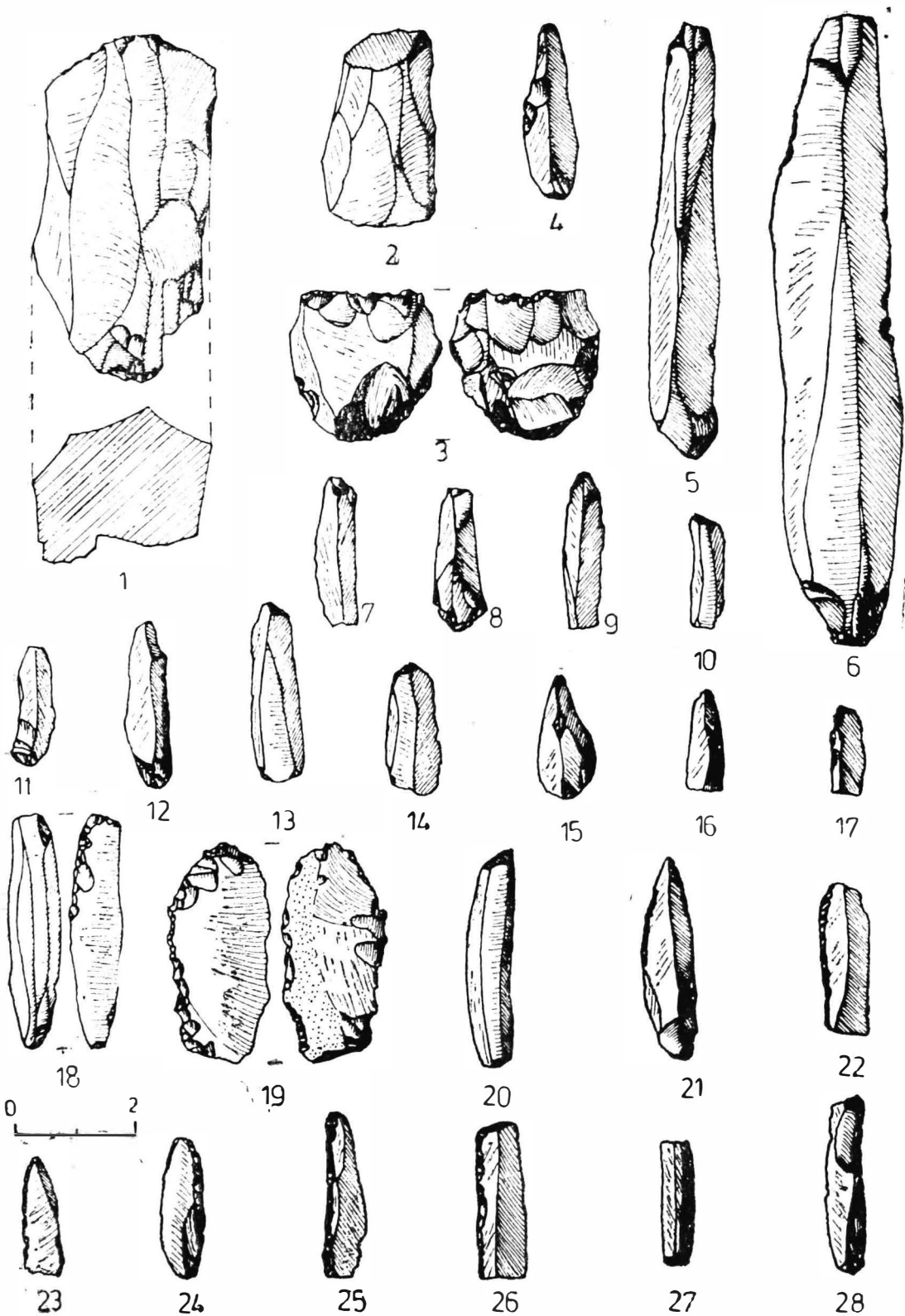


Fig. 70 — Găhlăi-Dârțu, level V (after G. S. Nicolăescu-Plopșor et al.).

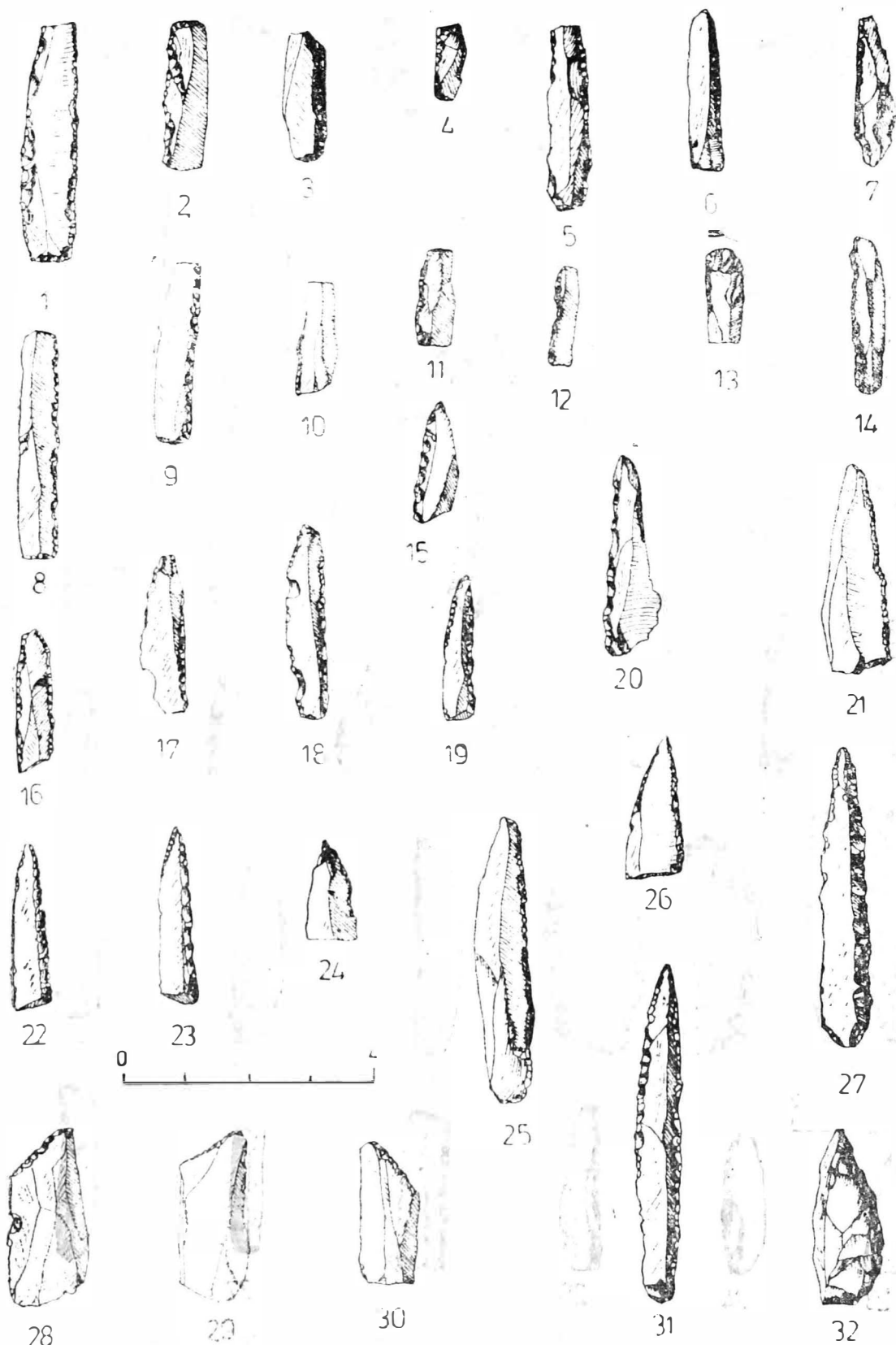


Fig. 71 — Ceahlău-Dirțu, level V (after C.S. Nicolăescu-Plopșor et al.).

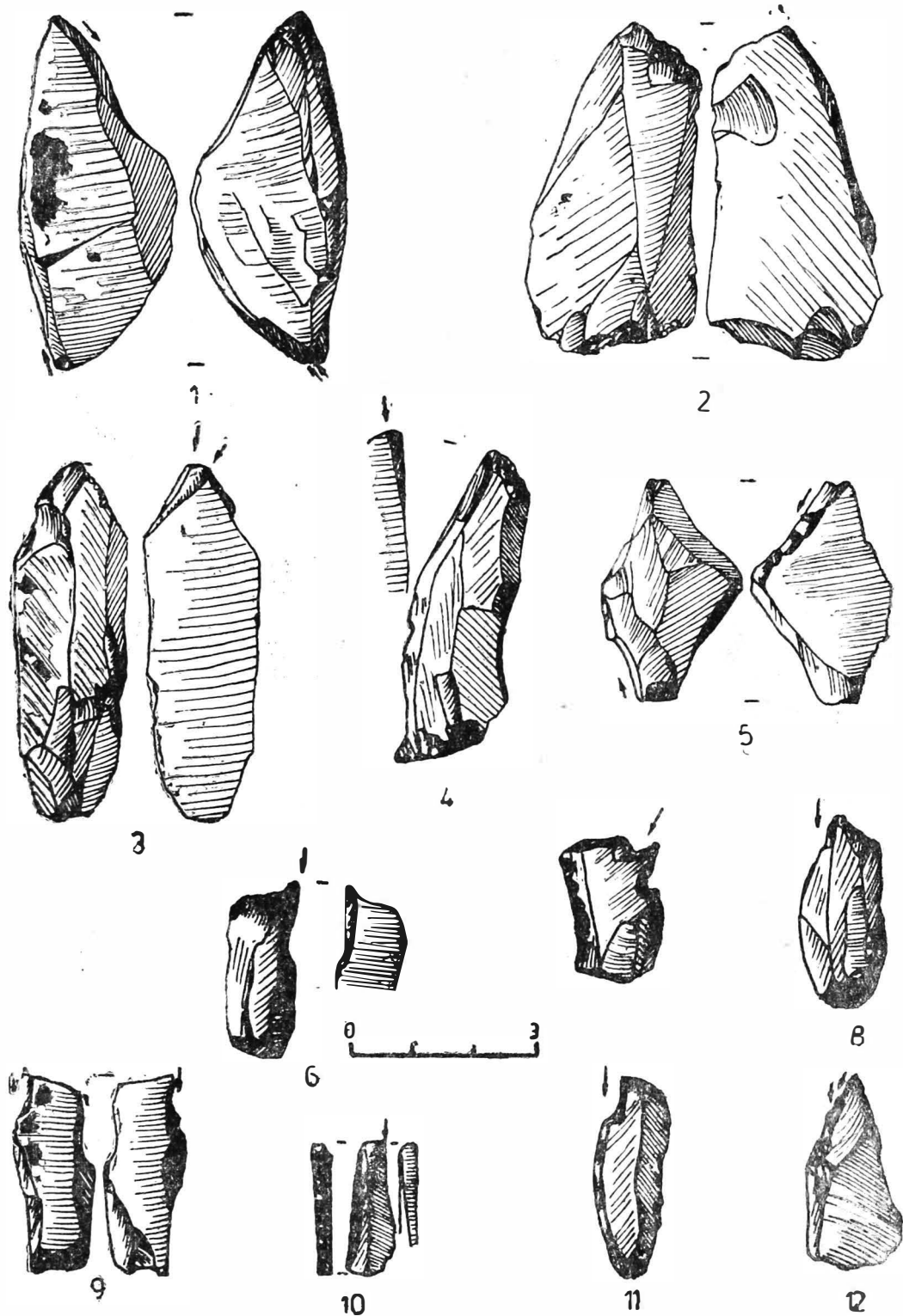


Fig. 72 — Ceahlău-Dirțu, level V (after C.S. Nicolăescu-Plopșor et al.).

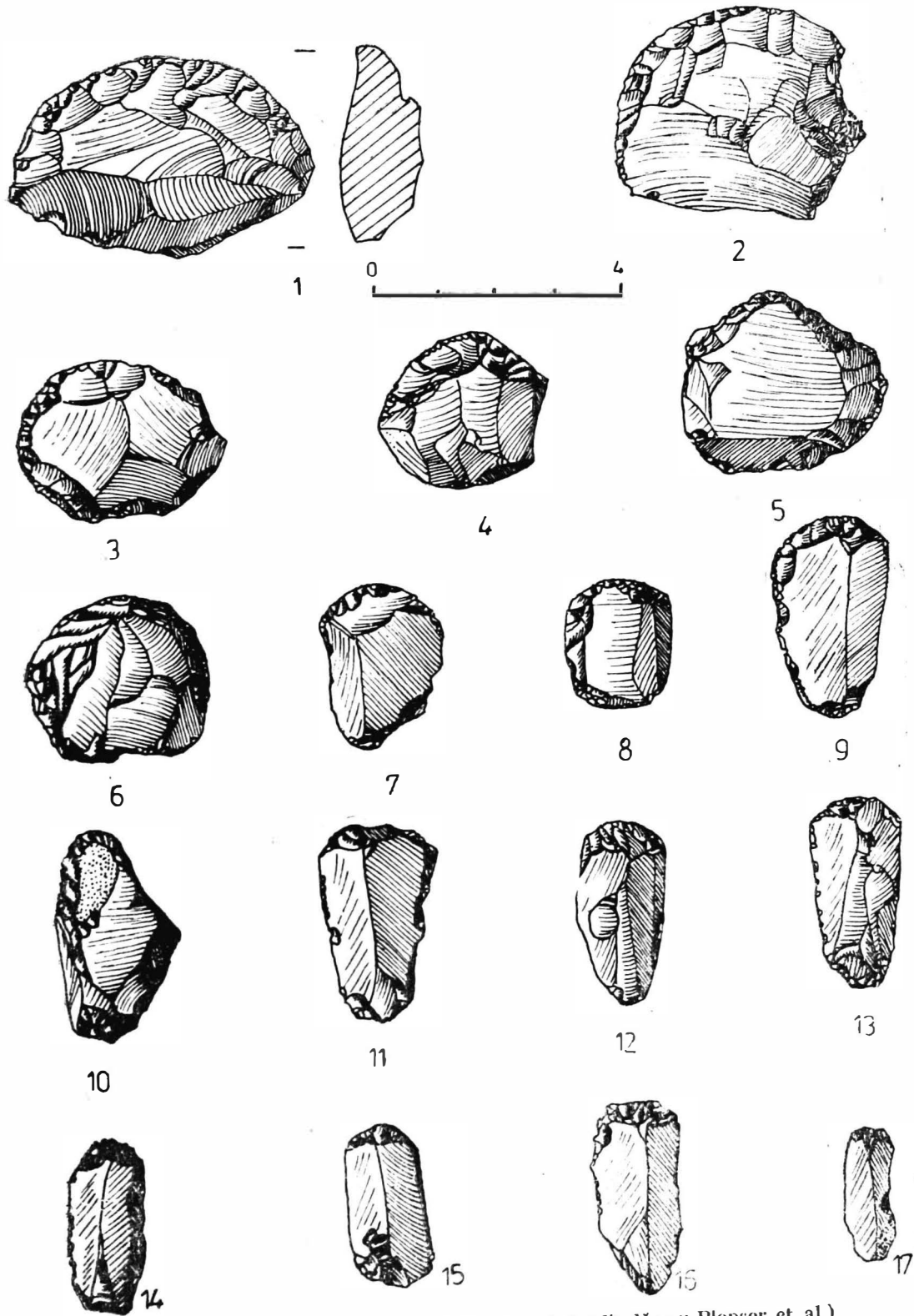


Fig. 73 — Ceahlău-Dirșu, level V (after C.S. Nicolăescu-Plopșor et al.).



Fig. 74 — Ceahlău-Dițu, level V (after C.S. Nicolăescu-Plopșor et al.).

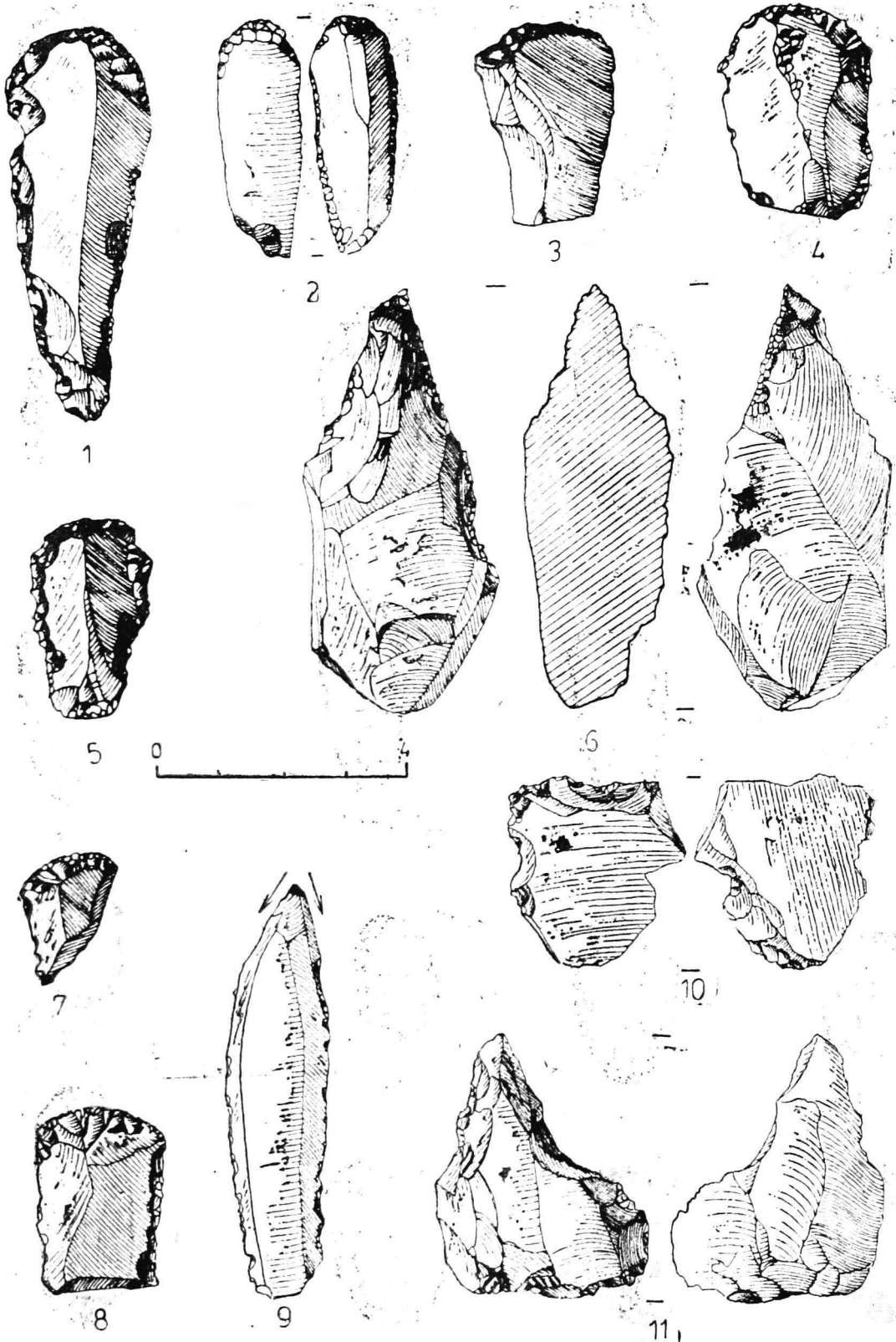


Fig. 75 — Ceahlău-Cetățica 1, level II (after C.S. Nicolăescu-Plopșor et al.).

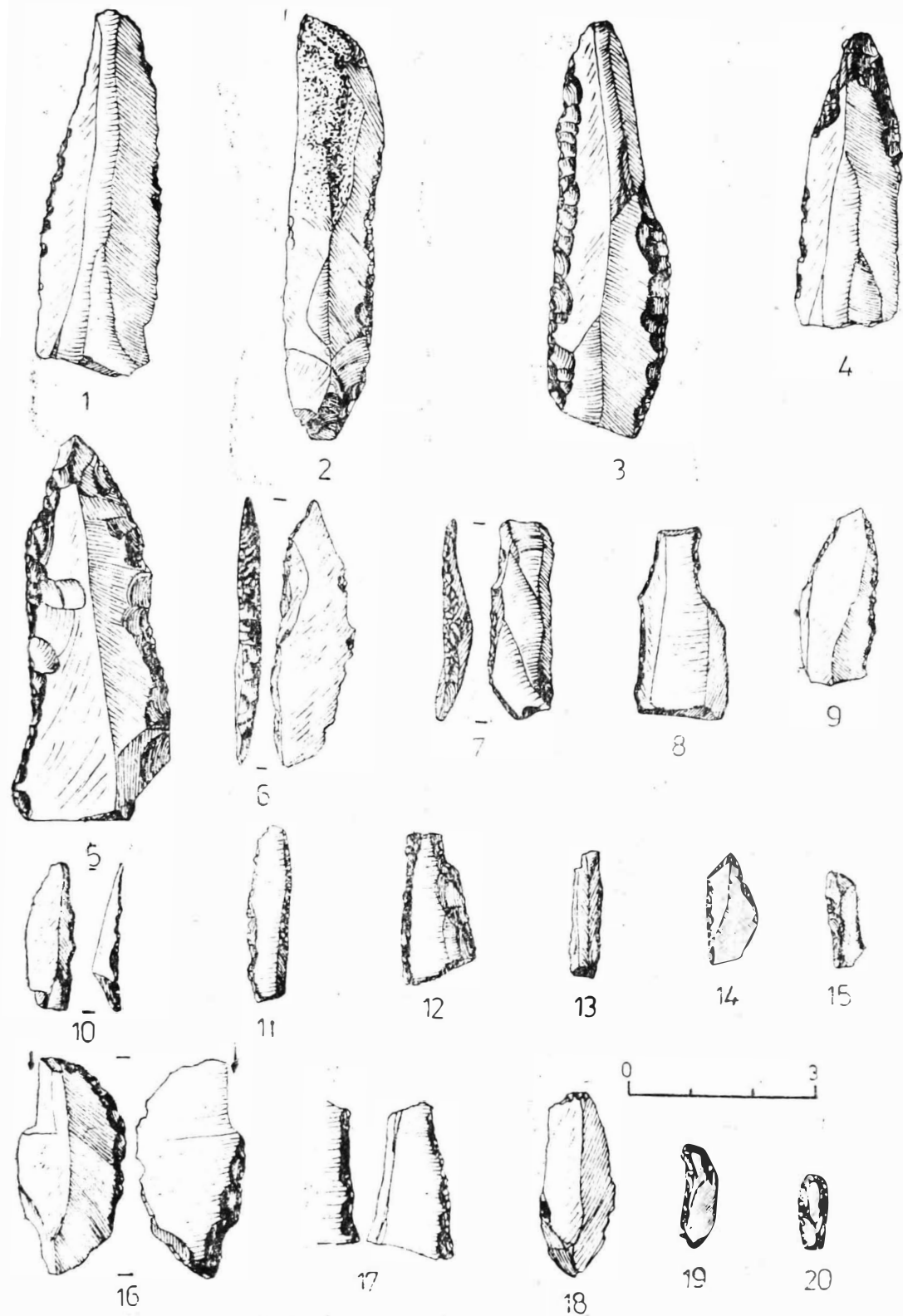


Fig. 76 — Ceahlău-Cetățica I : 1—9, level II ; 10—15, level III ; 16—20, level IV (after C.S. Nicolăescu-Plopșor et al.).

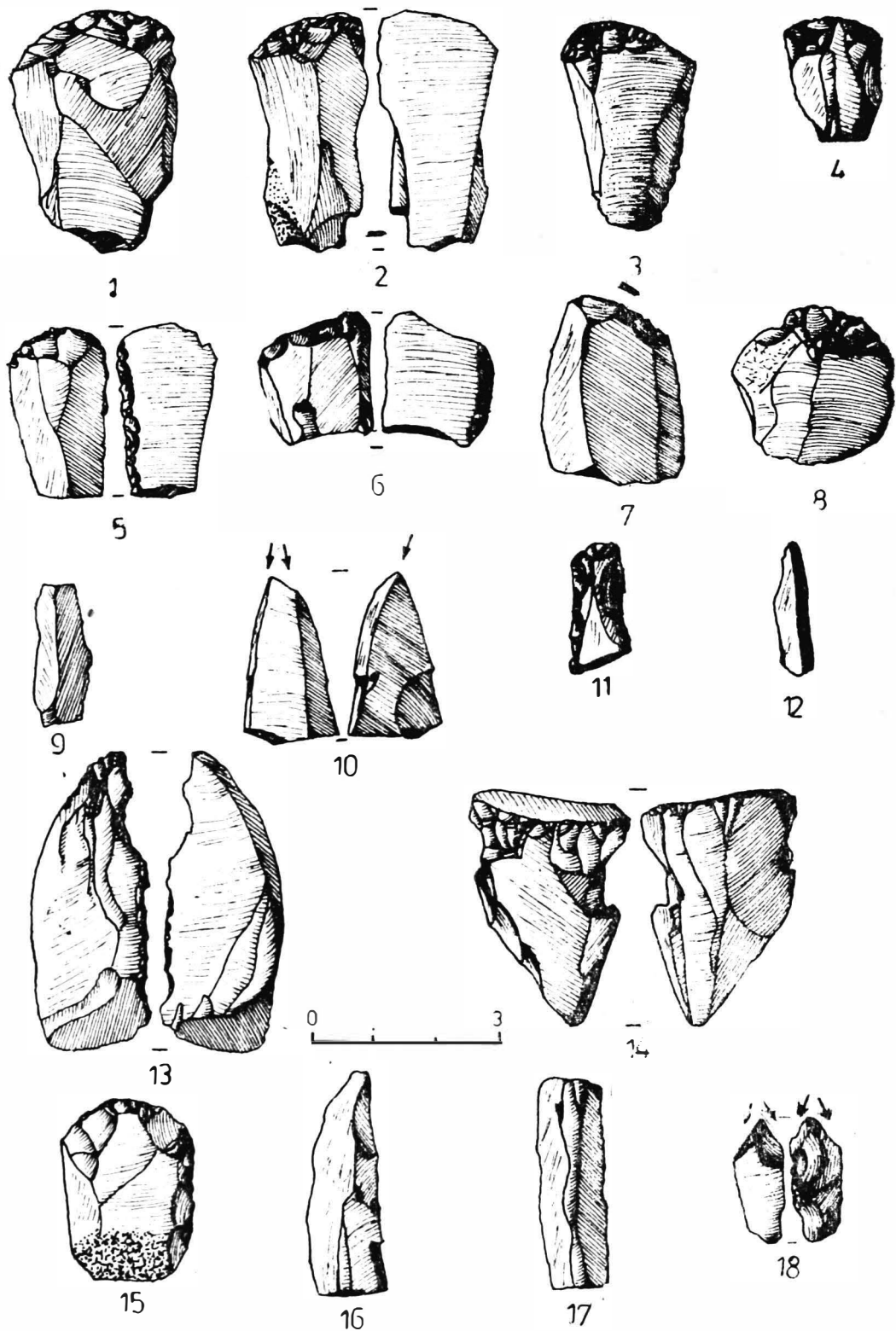


Fig. 77 — Ceahlău-Gremeniș (1–12) and Bofu Mare (13–18) (after C.S. Nicolăescu-Plopșor et al.).

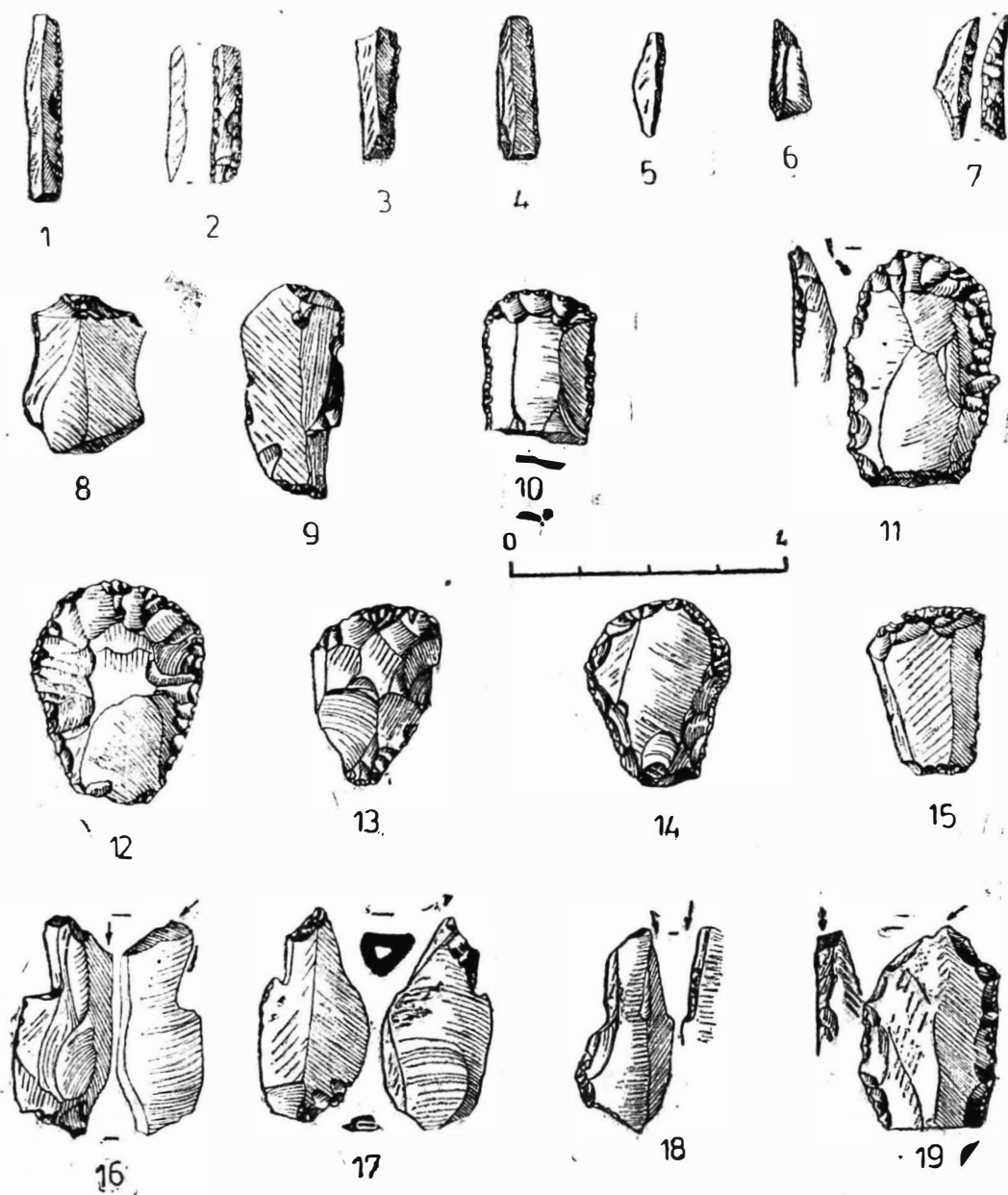


Fig. 78 — Ceahlău-Podiș, level II (after C.S. Nicolăescu-Plopșor et al.).

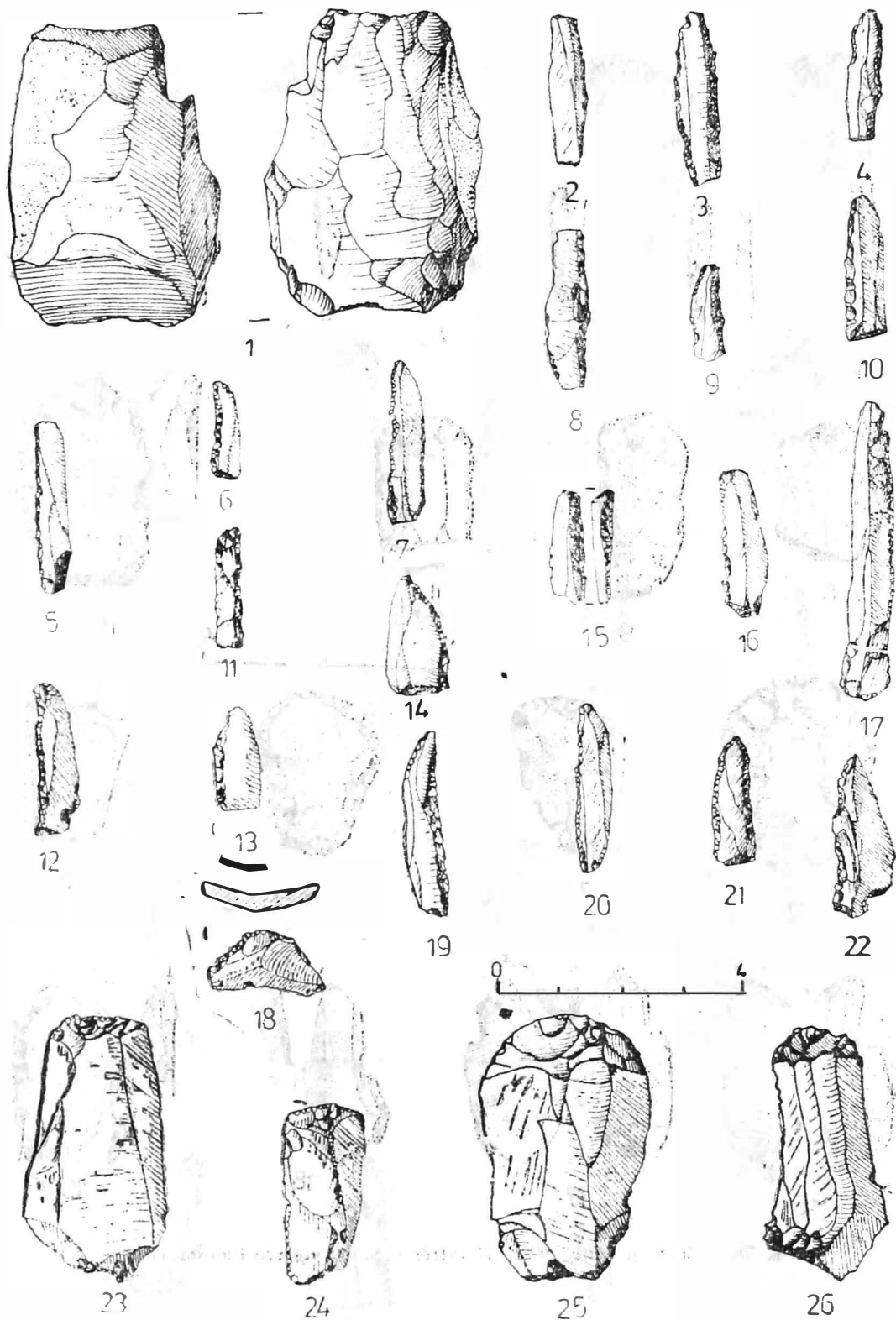


Fig. 79 — Ceahlău-Podiș, level III (after C.S. Nicolăescu-Plopșor et al.).

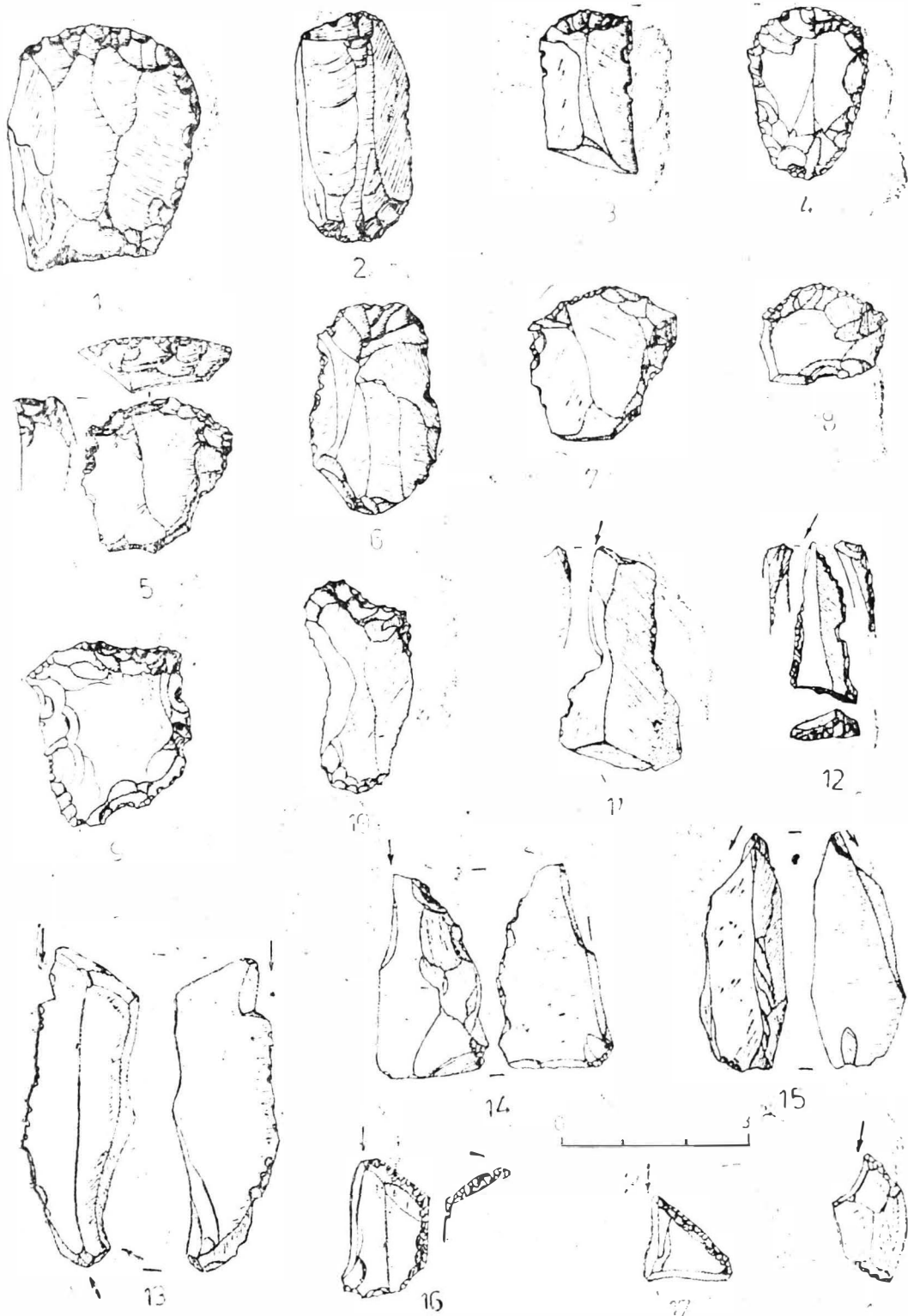


Fig. 80 — Ceahlău-Podiș, level III (after C.S. Nicolăescu-Plopșor et al.).

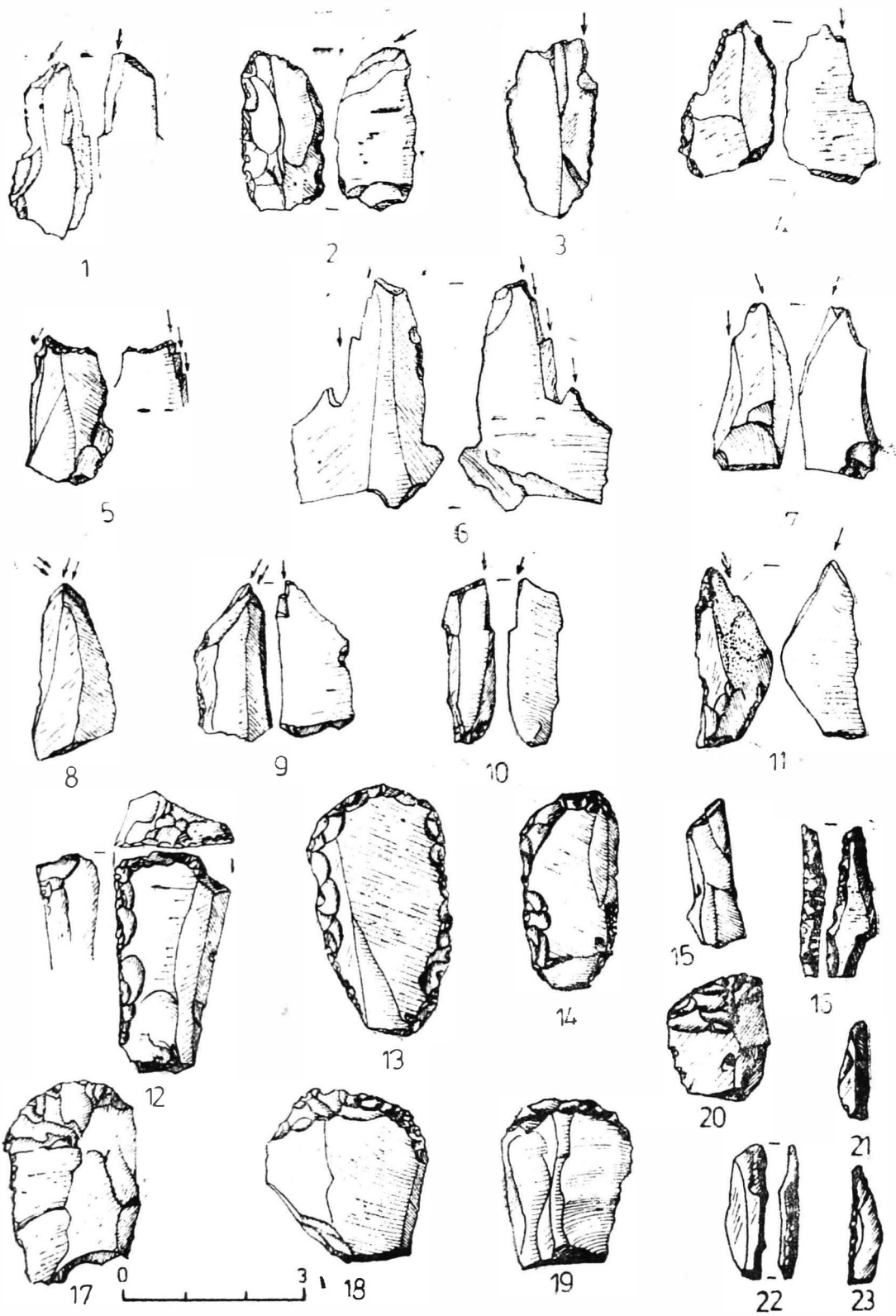


Fig. 81 — Ceahlău-Podiș : 1–11, level III ; 12–23, level IV (after C.S. Nicolăeșcu-Plopșor et al.).

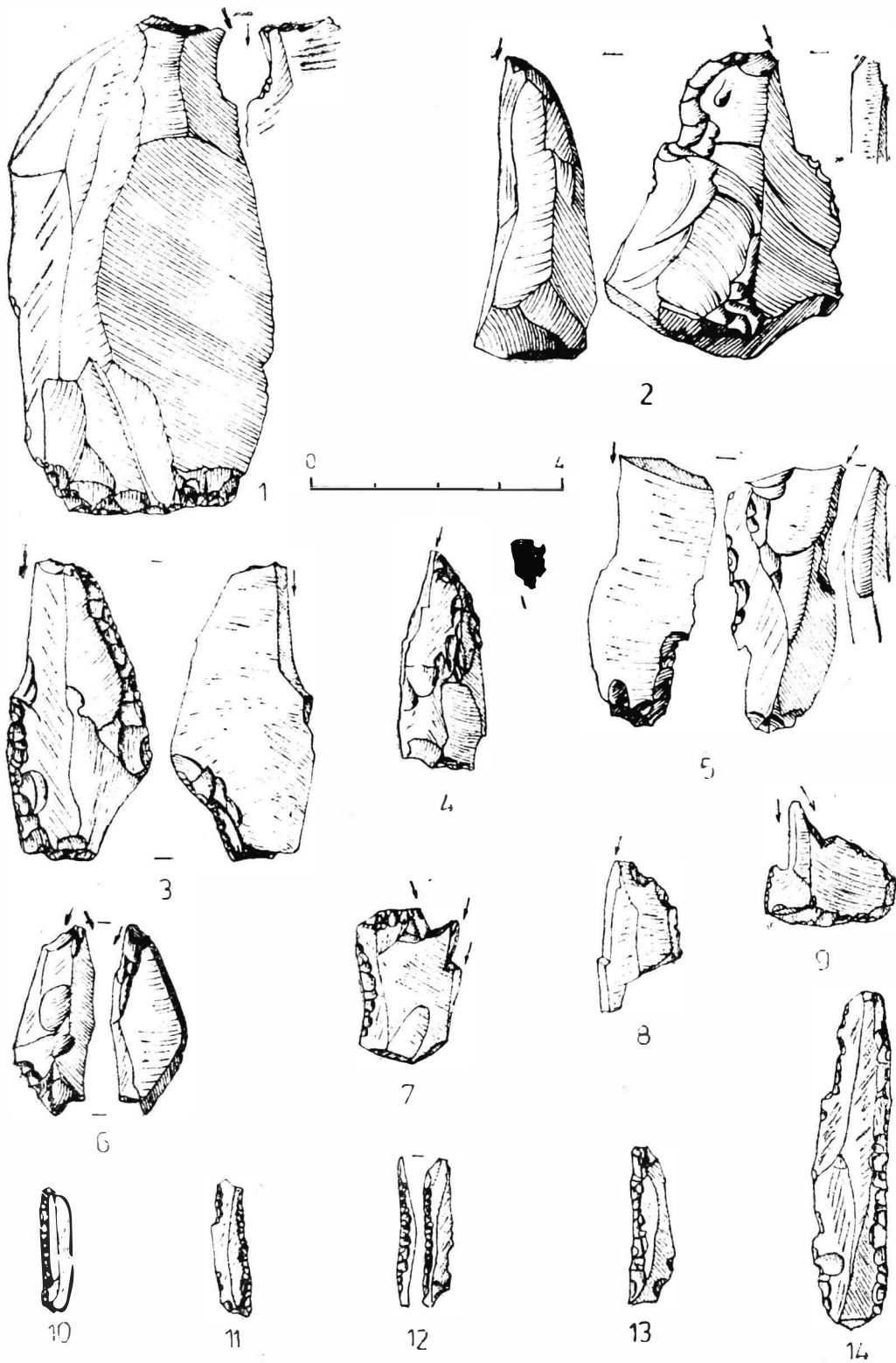


Fig. 82 — Ceahlău-Podiș, level IV (after C.S. Nicolăescu-Plopșor et al.).

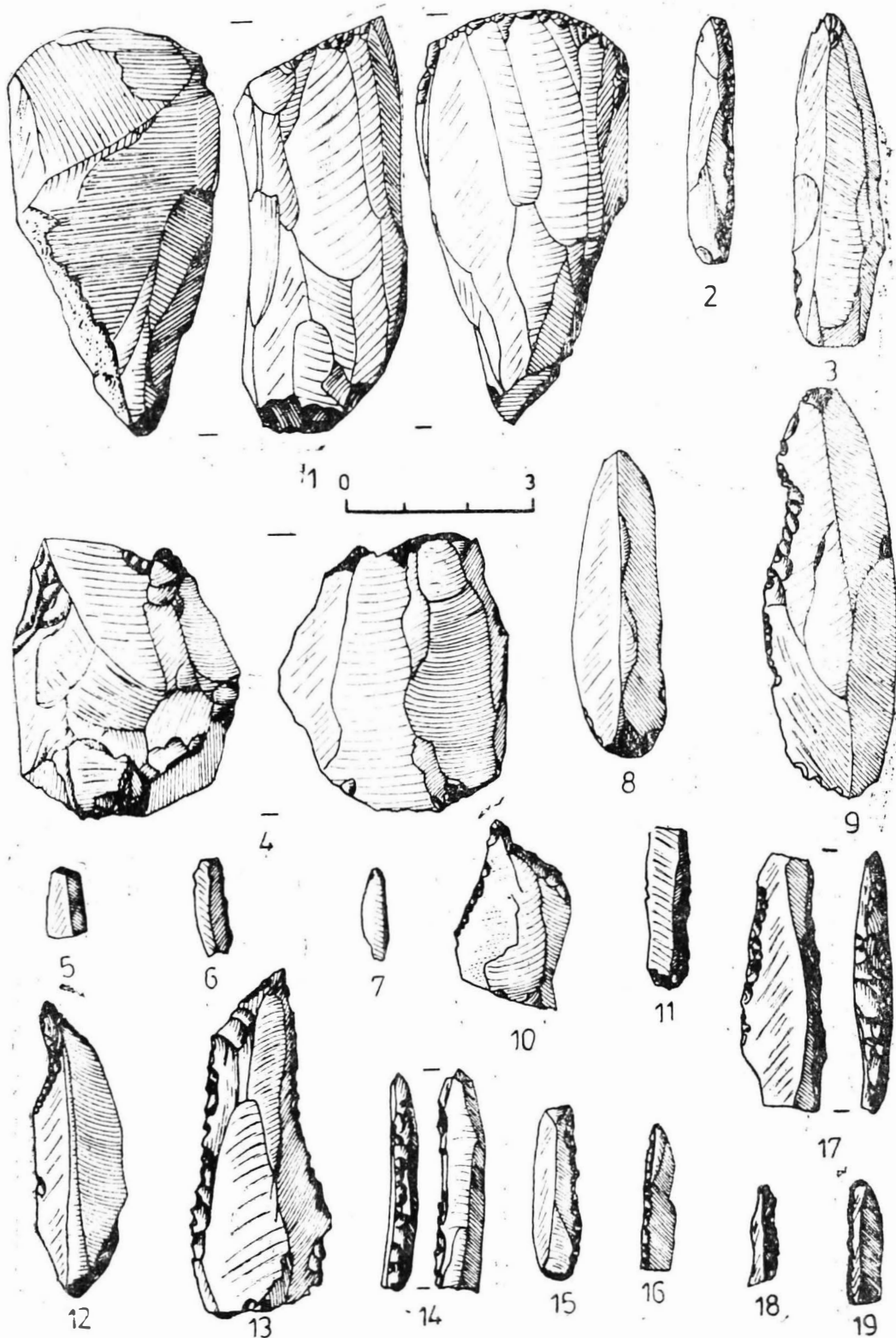


Fig. 83 ← Ceahlău-Podîș, level V (after C.S. Nicolăescu-Plopșor et al.).



Fig. 84 — Ceahlău-Podis, level V (after C.S. Nicolăescu-Plopșor et al.).

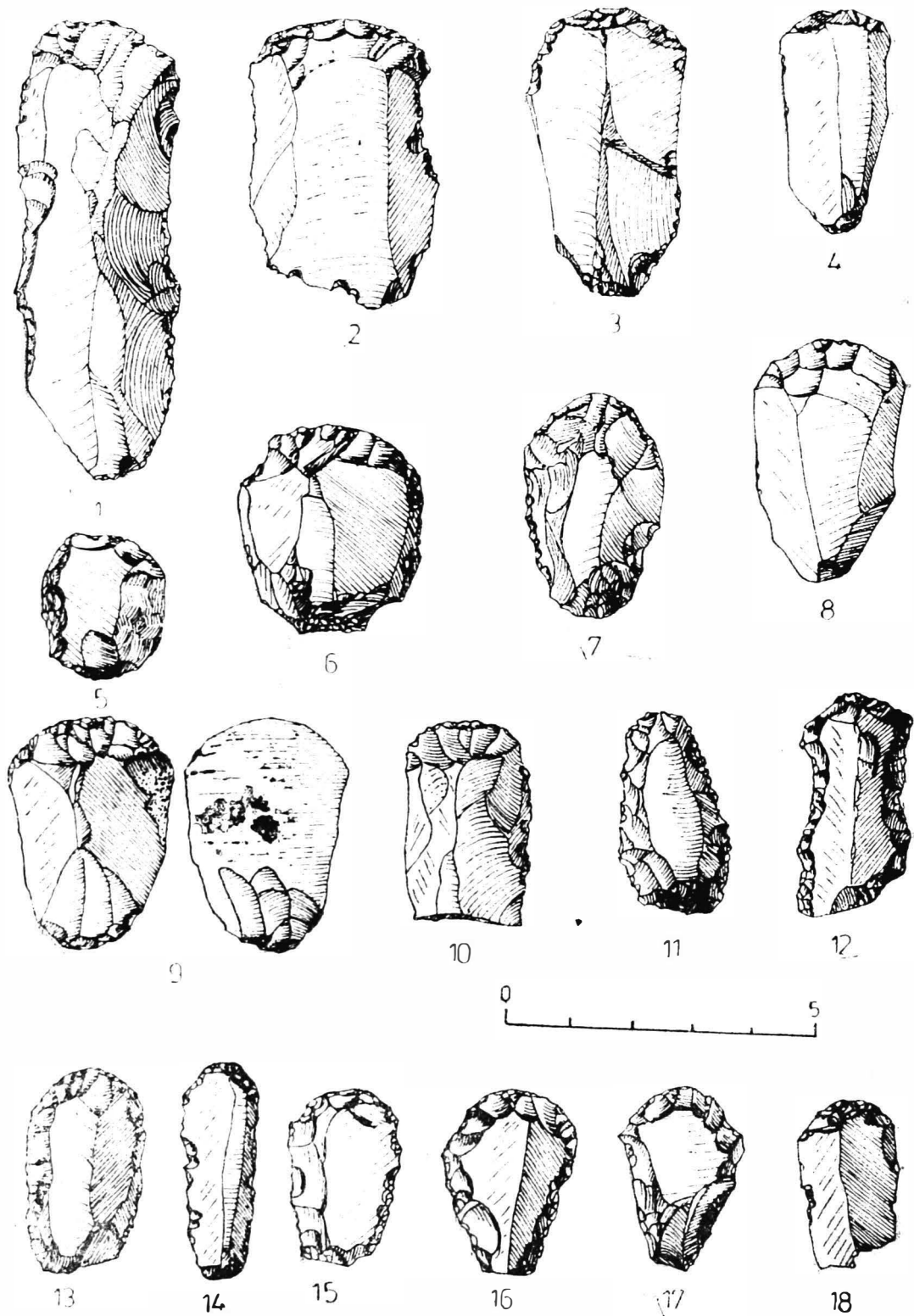


Fig. 85 — Ceahlău-Podiș, level V (after C.S. Nicolăescu-Plopșor et al.).

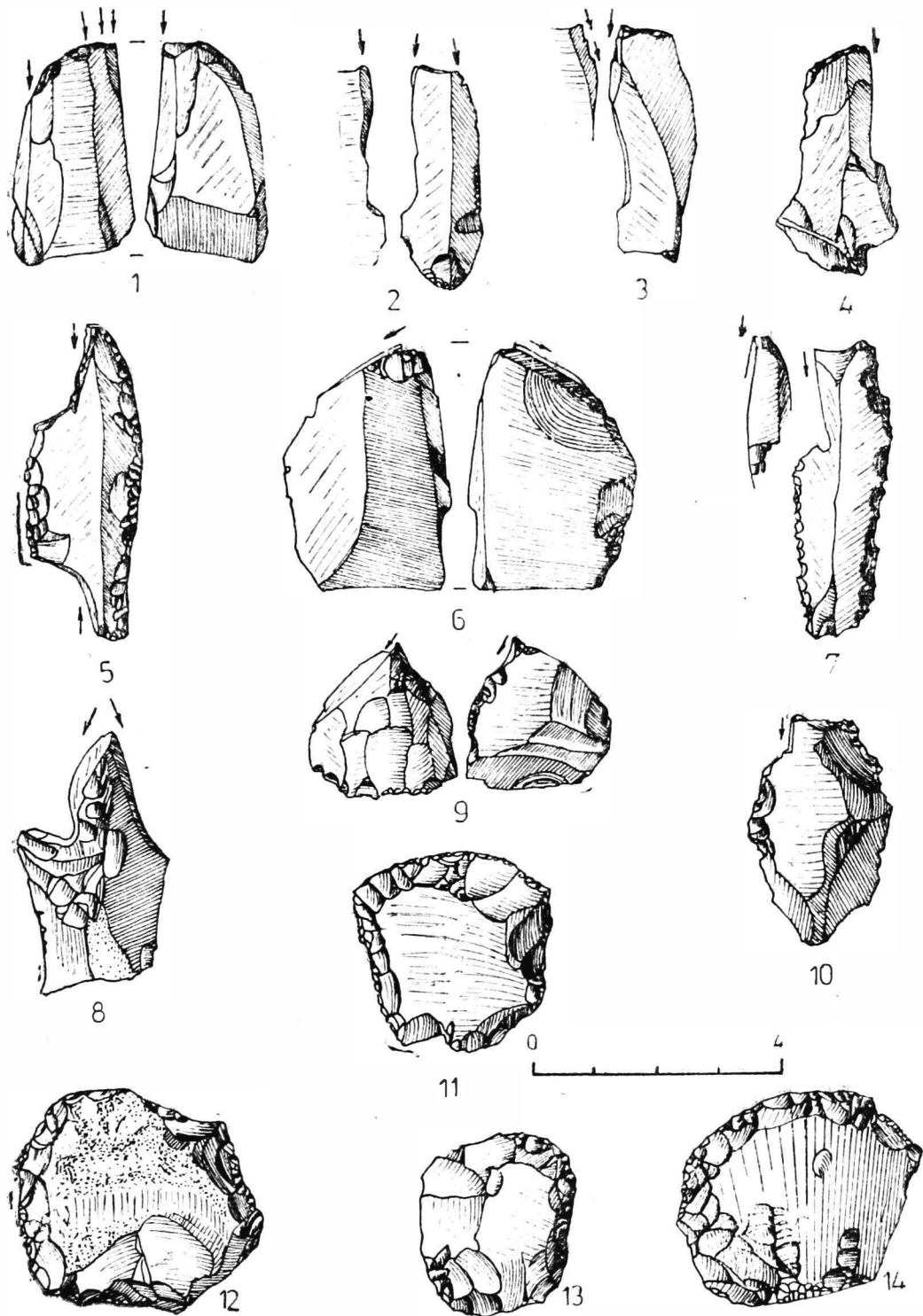


Fig. 86 — Ceahlău-Podiș, level V (after C.S. Nicolăescu-Plopșor et al.).

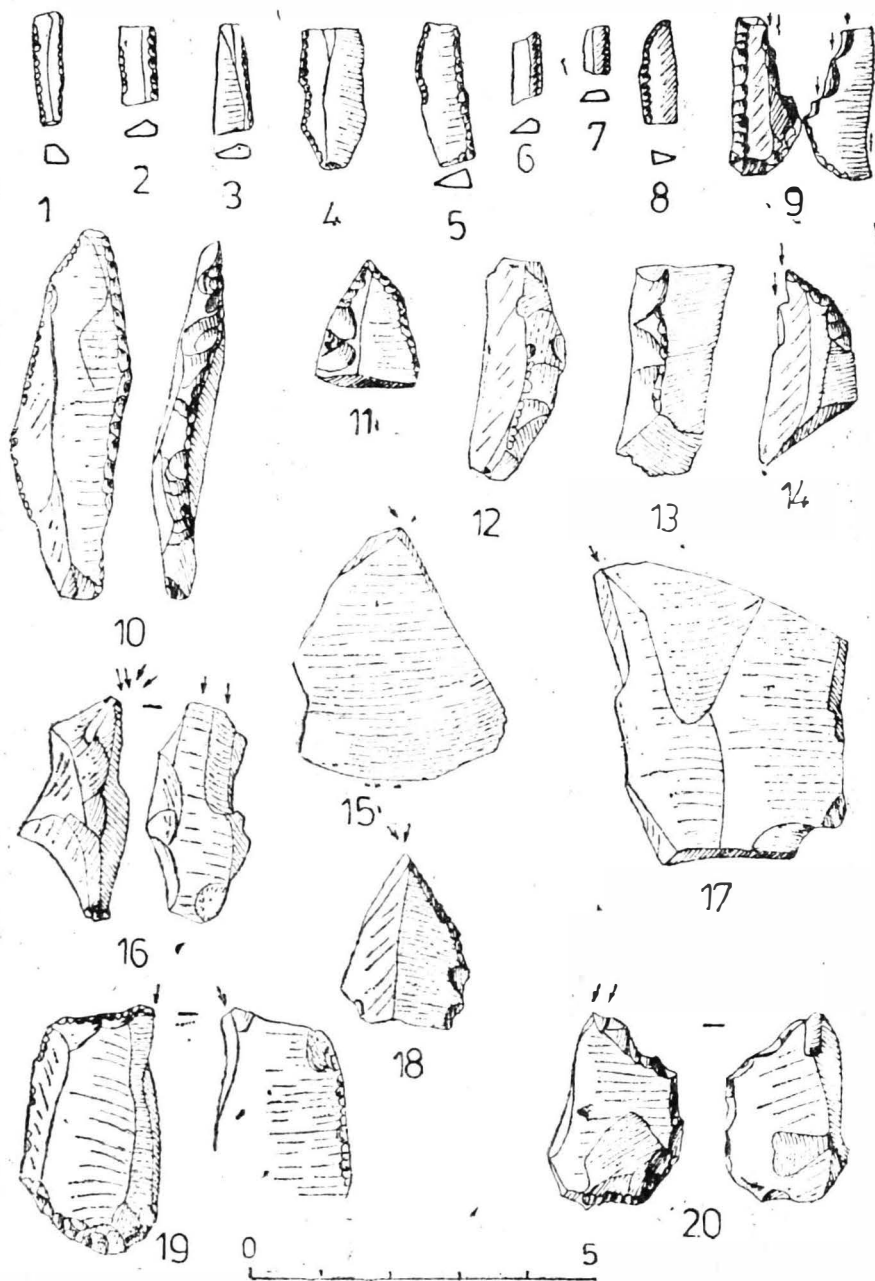


Fig. 87 -- Puricani, complex C (after M. Brudiu).

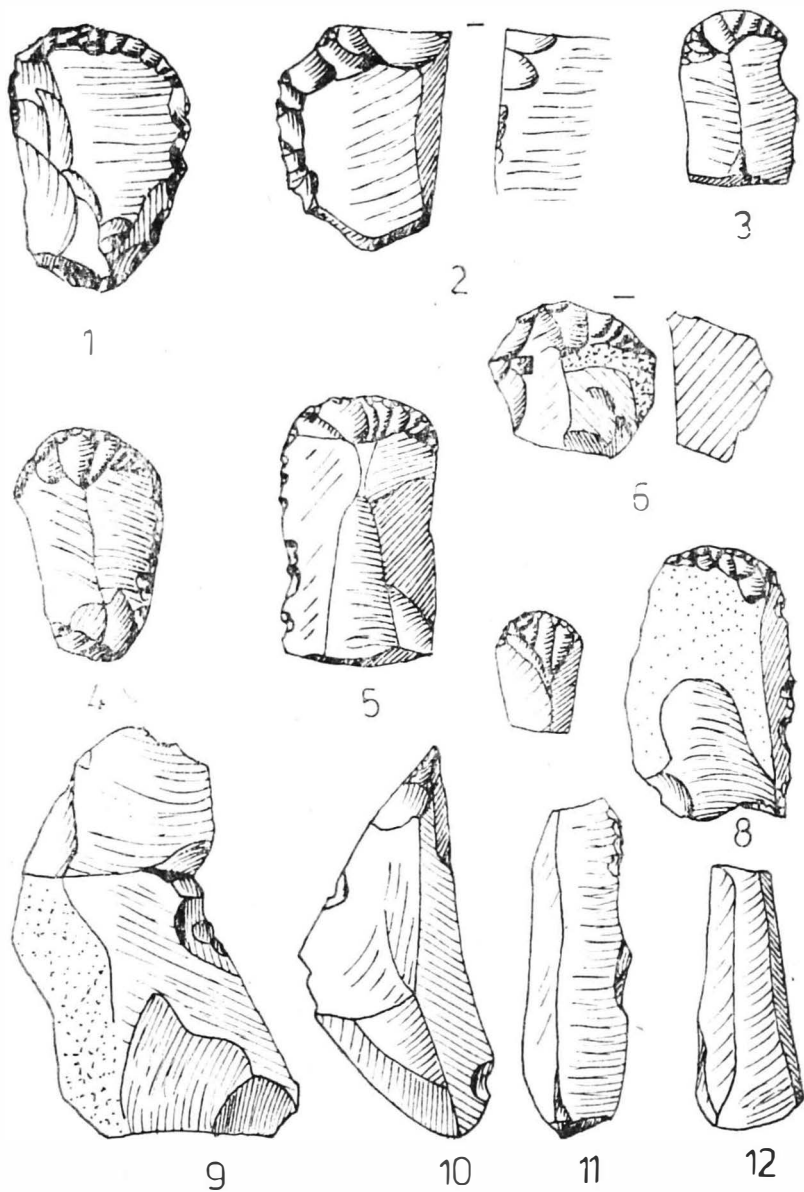


Fig. 88 — Puricani, complex C (after M. Brudiu).

**Tiparul executat sub cd. 263
la Intreprinderea Poligrafică Iași
str. 7 Noiembrie nr. 49**

15 lu²

BIBLIOTHECA ARCHAEOLOGICA IASSIENSIS

**I LA CIVILISATION DE CUCUTENI EN CON-
TEXTE EUROPÉEN, IASSY, 1987. Eds. M. Pe-
trescu-Dimbovița, N. Ursulescu, Dan Monah,
Vasile Chirica.**

**II LA GENÈSE ET L'ÉVOLUTION DES CUL-
TURES PALÉOLITHIQUES SUR LE TERRI-
TOIRE DE LA ROUMANIE, IASSY, 1987. Ed.
Vasile Chirica.**